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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 1. SAN FRANCISCO, SATURDAY, JULY 6, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

The Ropp Straight-line Furnace.

Herewith is portrayed the Ropp Straight-line Furnace, now in operation at the Selby Smelting and Lead Works, Selby, Cal. It is the invention of Mr. Alfred Ropp, superintendent of the Selby Smelting and Lead Works, and was patented in the United States last January.

It is the result of his experience and familiarity with mechanical roasting furnaces in this country and Europe, and is claimed to furnish an improved method for the roasting or chloridizing of base or sulphuretted ores, or the roasting of mattes.

The exclusive rights to the manufacture and sale of the Ropp Furnace, under the United States patent, have been granted by the inventor to Parke & Lacy Company, 21 and 23 Fremont street, San Francisco.

The furnace consists of an ordinary reverberatory hearth built in a straight line or rectilinear in form. In the center of the hearth there is a longitudinal slot or channel as shown in the figure on page 6. Through this slot an arm, connected below with a four-wheeled truck or carriage, extends upward, and across the upper end of the arm is the supporting bar from which the rabbles, or stirring teeth, project. The carriage runs upon a track below the slot or chaunel in a chamber provided for it, where it is accessible at all times aud while the furnace is in operation. This chamber continues the entire length of the furnace and is made sufficiently large to admit of a man going under the carriage and making any repairs that may he necessary. Four of these carriages are placed at equal distances from each other and are attached to the steel wire rope hy which they are propelled; aud the rabble arms are so constructed that each side can be adjusted independently of the other by means of screws and slots, and can be set so that the rabbles shall reach the ore on the hearth to the proper depth. The track, after passing underneath the furnace throughout its entire length, is continued parallel with and exterior to the furnace, describing a curve at each end. The description given by the Parke & Lacy Co. says :

"The driving mechanism of the furnace is of the simplest form, consisting of two bevel gears with their shafts, and a horizontal sheave, on the vertical shaft, around which a steel wire rope travels. A similar sheave is mounted on a vertical shaft at the opposite end of the furnace. All of this mechanism is outside the furnace, and easily accessible for oiling and repairing. The rope does not get hotter than the hand can bear, and it is not necessary that it should he taut. The ore is automatically fed into the furnace at the feed end through Challenge feeders, and is moved along the hearth, at any speed desired, hy the rahbles, which are carried by the moving carriages or trucks, and is automatically discharged, by gravity, into a hopper or car at the discharge end. During the time required for the carriages to pass over the length of the track exterior to the furnace, from the point of exit to the point of eutrance, the rabbles become thoroughly cooled and in condition to again enter the furnace. Three or more fireplaces are used, depending upon the fuel and the work to he done. These fireplaces are shown on the plan or horizontal section, and can he arranged for either hand or automatic firing. By adjusting the automatic feeder the capacity of the furnace can be increased or diminished, and an ore can he roasted 'dead' or it can be discharged from the furnace, retaining any portion of the original percentage of sulphur.

"In chloridizing the salt can be fed at any point, thereby saving the immense loss of salt and silver common to those forms of furnaces in which the salt is fed with the raw ore. The furnace may also be used as a cooling or drying hearth, and the general arrangement is such that it may, by slight changes, be adapted to advantageously replace any other form of roasting, chloridizing or drying furnace. The standard furnace is 105 feet long and 11 feet wide in the clear, and has a capacity of roasting 36 tons of ore, containing 20 per cent sulphur, 8 per cent lead and 17½ per cent zinc and iron pyrites down to 5 per cent of sulphur, in twenty-four hours. To roast 'dead' the furnace requires slow feeding, and will handle from 20 to 22 tons in twenty-four hours, reducing the sulphur contents to less than one-half of one per cent."



PERSPECTIVE VIEW OF FURNACE.



ONE OF THE FIREPLACES.

VIEWS OF THE ROPP FURNACE AT THE SELBY SMELTING AND LEAD WORKS, SELBY, CAL.

THE president of the First National Bank of Creede, Col., is quoted as saying that millions of dollars are being invested in gold mines by men who are afraid it will be found out, and hurt their business standing. The Creede bank president is creating an atmosphere in which to flap the wings of fancy. The business men who are investing in mining property are not any less desirous of having the fact known than that of any other business proposition. There is nothing to be ashamed or afraid of, and the old silly idea which classified lottery tickets and miuing shares together is obsolete. Mining is just as legitimate a proposition as any other form of business, and any attempt or desire to keep investments quiet must be ascribed to the natural reticence of any man who does not care to make public his private affairs.

THE Trail Creek, B. C., discoveries give fresh proof of the folly of trusting to the tourist prospector, the man who covers fifty miles a day, and says: "I've been all over that country; there's nothing in it." The section that is now yielding so well has been "prospected" repeatedly, but never till recently in a close, painstaking way. Being in too big a hurry has lost many a prospector many a fortune.

REPORTS from the London mining share market indicate that some of the mining stock brokers there resident have mastered the worst phases of the business. Parisian buyers of South African shares now have men specially employed in London to see that shares bought by their clients are actually purchased and properly registered, realizing from experience the ease of the broker who is a bear juggling with an order for purchase.

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J. F. HALLORAN.....General Manager

San Francisco, July 6, 1895.

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THE Brunswick lode proposition meets with almost universal favor. There is a good prospect for the Comstock, even now, if the owners work the mines rather than the street, and introduce modern milling methods which exclude manipulatiou of the returns.

THE index to the contents of the seventieth volume of this journal, which appears on pages 12 and 13 of this issue, gives an idea of the scope and variety of the articles published hereiu during the last six months, and will he of value to the thousands of our readers who preserve their papers for reference.

THE Sacramento *Bee* sees in the suit against the North Bloomfield the unconstitutionality of the Caminetti bill and "the closing of the small mines." The *Bee* is more thau ordinarily ridiculous in this instance. The question is shall the company mentioned continue operations under decree of the court or under the provisions of the Caminetti hill? The *Bee*, like its morniug colleague, is doing all it can to stir up hostility to the hydraulic miner, evidently under instructions from its corporation masters, who began warfare upon the miners through their kept papers about the time the miners began to oppose the attempted wholesale illegal absorption hy the corporations of the mineral area of this commonwealth.

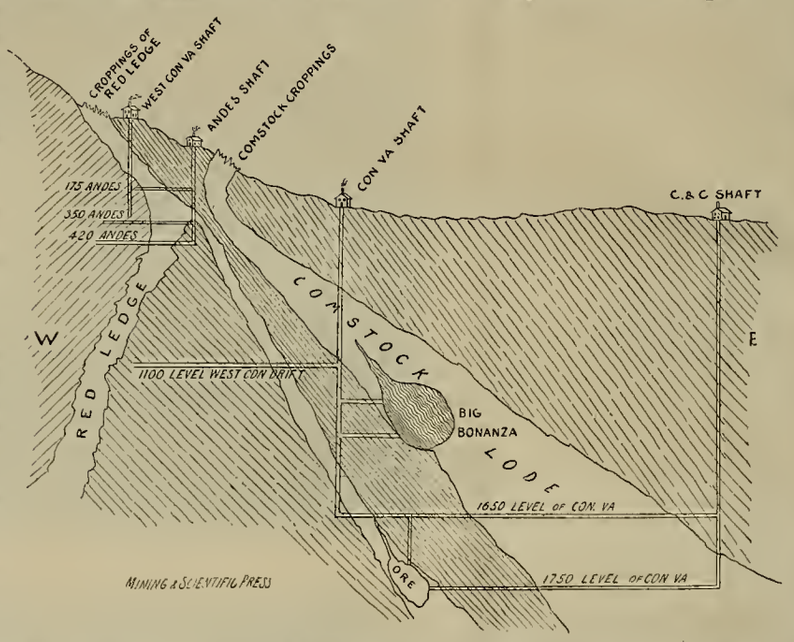
A SHASTA COUNTY PAPER says: "The only reason why there are uot more wealthy mining companies operating in this county is because it is difficult to find mines that are known to be extensive." A Nevada county paper asserts that there are plenty of good mines unworked because nowadays it takes an aggregation of capital more than one individual can usually command. These two simultaneous assertions, made independently of each other, not in auswer, but as separate expressions of belief, form a good illustration of the need on the one hand of development work and on the other of such an association as that recently outlined herein. A good property developed sufficiently to demonstrate its value need not long go begging.

The West-Side Lode.

Probably no mining district in the world offers a wider field for geologists than does the Washoe in Storey county, Nevada. Although many eminent scientists have given that section, particularly the Comstock lode, large personal attention, yet we fail to find any two in full accord as to the origin of the fissure and its mineral deposit. The contention regarding the fissure seems to have settled down to a conviction that it was caused by volcanic action. Writing on the Comstock lode, Baron Richthofen states that the rending of the fissure was due to the eruption of trachyte which accompanies the vein at a distance of two miles to the east. Sanidine-trachyte is a volcanic rock, and, though it did not pour out from the craters of actual volcanoes, yet it must have been attended hy the same phenomena which accompany the outbreaks of lava. The process which immediately follows the opening of fissures at or near active volcanoes is the violent emission of steam. The scientist calls a crevice in this case a solfatara. It has heen proven by extended researches into the causes of the volcanoes in Iceland, South American Andes, Canary Islands, and the tertiary volcanoes of Hungary and Transylvania, that every solfatara in the course of time passes through stages. The first is when the steam is accompanied hy gaseous combinations of fluorine and chlorine. The second is when it is accompanied hy those of sulphur, while still a third is ordinarily marked by the emissions of carhonic acid and combinations of hydrogen and carbon, at which time the term solfatara is no longer applicable. Commenting on the above proposition, Baron Richthofen thinks that in the elements evolved during the first two periods are all the conditions required for filling the Comstock fissure with such substances as those of which the vein matter is composed. Steam ascending with vapors of fluosilicic acid creates in its upper parts, according to well known chemical agencies, silica and silicofluohydric acid, the former in solid form, the latter as a volatile gas, which acts most powerfully in decomposing the rocks it meets on its course. The chloride of silicon in combination with steam forms silica and chlorohydric acid. Fluorine and chlorine are among the most powerful volatizers known, and form volatile combinations with almost every suhstance. Besides silicon, the metals have great affinity with them. Well known and recognized scientists affirm that all those which occur in the Comstock vein could ascend in a gaseous state in comhiuation with one or the other of them. They must then he precipitated in the upper parts as metallic oxides or chlorides in the native state. Reasoning from this point of view, the Comstock fissure was gradually filled from its upper portion downwards, with all the elements found chemically deposited in it. The hetter informed miners on the Comstock, who reason from scientific knowledge and also from practical workings on the lode, have held to the opinion that lying to the west and running farther under Mount Davidson would ultimately be found the mother lode, from which was precipitated the various chemical properties and lighter metallic suhstances which filled in the Comstock fissure. They contend that the main west lode would he found almost entirely gold hearing, and that it would be more clearly defined and more conformatory to lodes in other deep mining districts. In this view they have heen largely strengthened hy work to the west on the upper levels of Crown Point, Belcher, Yellow Jacket, Alpha, Andes and West Con. Virginia, not to say anything regarding the shafts sunk to the west and good results found many years ago, but from which they were driven by water. This theory, hased on scientific knowledge derived from mining districts of a similar character, found confirmation in horings by the Yellow Jacket Mining Co. to the west on the 3,000-foot level, where they tapped a powerful stream of water which was heavily charged with hydrogen sulphide and had a temperature of 170° F., with equal evidence of the presence of carbonic acid in the water of the lower levels.

The engraving herewith given presents a hetter idea of the west lode theory as shown in workings on the Con. Virginia ground. The shafts as given show the first workings on the lode; and as water interfered with the workings, shafts were sunk still farther to the east so as to get at the lode at greater depth.

To confirm the west-side lode theory at depth, the West Con. Virginia mauagement started work, through the company's superintendent—H. W. Tangerman, au experienced and well-known mining man—westward as the cut shows from the 1100-foot level of the old Con. Virginia shaft, which had heen used to hoist the ore of the great houanza of the Consolidated California & Virginia mine. This great ho-



nanza of ore was to the eastward of this shaft and some 100 or 150 feet deeper at its heginuing. From that point it extended downward several hundred feet. Before the drift on the 1100-foot level was started hy Mr. Tangerman, theoretical miners had contended that Mt. Davidson, west from the Comstock lode, was a solid mass of syenite, which theory has been exploded by the drift as it was pushed west. Starting in a west crosscut, which had been ahandoned by the Con. California & Virginia miners, that had heen extended about 475 feet west from the shaft, and in the west wall of the Comstock lode, Mr. Tangerman contiuued on westerly. As this work is of a very interesting and important character, he has heen interviewed regarding his penetration into that unknown country. Mr. Tangerman says: "I first passed through the west wall of the Comstock, which has an easterly pitch of 45°, and entered a narrow vein, consisting of porphyry seams of quartz and clay, some 100 feet west of the starting point.

"This vein had a little water in the quartz seams hut did not show much mineral. It terminated against a solid wall of quartzite, 610 feet west of the the shaft. This west wall pitched cast at an angle of ahout 65°, and corresponded to the pitch or angle of the vein. There was nothing in the miueral line to excite attention in this narrow vein, so I continued on to the west through as tough a wall of quartzite as was ever penetrated hy a miner. It was 275 feet thick, standing at an angle of 65° or ahout 25° from a perpendicular. We next went through ahout 50 feet of black, hard porphyry with soft seams running through it in various places. Then followed ahout 30 feet of porphyry interspersed with seams of clay. At this point, some 960 feet

west from the station, we struck a strong flow of hot water. This hot water caused a stoppage of work. When the water had run off sufficiently we continued on west 150 feet farther through a quartz-porphyry formation. At this point the crosscut entered a syenitic formation which was blockey, like basalt. The crosscut continued in this last formation for 400 feet. As we passed out of this last formation another strong flow of hot water came in on us, and with greatest difficulty we have succeeded in getting in some 15 feet in a vein greenstone where the crosscut has been temporarily stopped to allow the water to flow off.

"This crosscut proves that the red ledge has turned well to the west and has assumed the shape of an antielinal vein. The water encountered in the narrow seams between the formation flows from that vein.

"As we get farther west we will find this vein, and I will then show the people of the Pacific Coast that all the mineral found in the Comstock lode to the east was an overflow from this back vein, and that the formation which my crosscut has passed through in the past 1,000 feet stands like a pyramid between the two veins. And, furthermore, the west vein will contain more gold in proportion in its vein matter, because gold, being heavier than silver in solution, will be retained in the back vein, while the silver flowed freely with the water and matrix that helped to make up the east vein. The east vein has formed with the country and is enclosed in the regular stratification of the mountain. The west vein has pushed up through the formation and runs at an angle contrary to the regular dip of the mountain. I hope to live to see more wealth taken from the antielinal vein than was taken from the Comstock lode. A little more work will prove my statement to be correct. In a few days I shall start up with a diamond drill and extend the crosscut in that manner until the vein above me is drained."

THE *American Economist* in a patronizing way suggests that "protection be accorded the mining interests," and that they "receive friendly recognition." Probably nothing could better illustrate the density of the average monometallist than the fact that a publication which represents some of the best thought of the country should so entirely miss the point. The *American Economist* is a clever, logical champion of the cause of protection; it upholds the doctrine of a high tariff and the levying of import duties on foreign manufacture to foster domestic manufactures. It is clear-headed, and with a broad horizon argues convincingly on political subjects. Yet, blinded by its environment and not realizing the existence of facts it fails to see, all it can say regarding the bimetallic question is that the miners should be "recognized" and have "protection" accorded them by the government. It appears to imagine, or affects to believe, that this is a case where "the mining interests" are alone affected, and that as a boon "the miners" should receive "recognition." If there is any one class of workers in this nation who do not need "protection" or "recognition" it is the miners. If there is any class not stricken adversely by the financial stress it is "the mining interests." The *American Economist* forgets or ignores the fact forced upon the nation's attention that this question of bimetallism is a national one, intimately affecting the prosperity of the workers, the producers of every manufactured product, whether as employers or employed; that the 64,000,000 people who never saw a mine are most intimately affected, and the 6,000,000 who live in the gold and silver producing region the least affected by the present effort to nullify the American Declaration of Independence. The one State of Illinois is believed to have lost more in the last 2½ years than all the gold and silver producing States and Territories put together. When silver slumped the State of Colorado simply ceased mining the despised white metal and began mining gold; the same way in other communities. In Illinois and similar States when the increased purchasing power of the gold dollar was felt in '93 the workers had no such resource; struck or worked at wages practically reduced. This matter is briefly referred to to illustrate how little even some of the clearest thinkers on the Eastern press understand the situation. It is neither the province nor the purpose of the PRESS to discuss politics, but those who make a business of that should certainly acquire some general knowledge of the facts before assuming to offer practical suggestions thereon. To be consistent, the *American Economist* should advocate protection to American industries and bimetallism for Americans. The two stand or fall together, and are diametrically opposed to free trade and monometallism.

Concentrates.

AN Austin smelter is to be built at Central City, Col.

CRIPPLE CREEK, COLORADO, claims a monthly gold output of $300,000.

THE Merced Gold Mining Co. have 200 men developing their properties at Coulterville, Cal.

E. H. BENJAMIN and associates have bought the Schneider claims, Granite Basin, Plumas Co.

THE Altoona Quicksilver mine last week sent down 190 flasks of quicksilver, valued at $7800.

THE White Horse Mining Co. has been incorporated at Helena, Mont. Capital stock, $500,000.

SUP'T G. E. BENT has resigned from the Le Roi and goes to Mexico, where he is interested in mining property.

FOLSOM is renewing its record of the days of '49, rich deposits close to that place now yielding $20,000 per month.

THE Mount Hood Consolidated Mining Company has incorporated with a capital stock of $1,000,000 at Spokane, Wash.

THE Tyro, near Coulterville, Mariposa Co., has begun crushing. Twenty-five men are employed. The shaft is down 500 feet.

F. I. HELLMAN, mining engineer on the Comstock, leaves this week for Johannesburg to superintend one of the numerous gold properties there.

ON the 1st the Napa Con. Quicksilver M. Co. paid the regular quarterly dividend of 10 cents a share, $10,000, and an extra dividend of equal amount.

IN Denver suit has been brought by the Mercantile Trust Company of New York for the appointment of a receiver for the Colorado Mining Stock Exchange.

C. M. SPANGLER, superintendent of the Standard mine, Oregon City, Butte Co., has 22 men employed. The Louisiana mine is expected to resume next week.

THE International Mining and Industrial Exposition to be held in Denver opens July 1, '96, provided satisfactory financial arrangements are effected.

A NEVADA exchange declares that there are several deposits of plumbago in Lyon county, so pure that lead pencils can be made out of the crude material, without any refining.

MESSRS. GODBE AND COLDRAN have an option on a controlling interest in the Sevier (Utah) Mining Co. By its terms $49,000 is to be paid on the 15th inst., and $50,000 more sixty days later.

T. HABISHAW, while working in one of the lower levels of the Marabel quicksilver mine in Lake county, was crushed to death by falling rock from the roof of the stope last Wednesday.

THE *Ledger's* Sonora correspondent says that the Rawhide mine at Jamestown cleaned up $34,500 in May with 20 stamps, and that the App, belonging to the same people, is doing about as well.

A COLORADO SPRINGS DISPATCH asks a confiding public to believe that a lady there resident, when properly hypnotized, can disclose the location of paying gold deposits in the adjacent hills.

THE Niagara mine, Shasta Co., is owned by a Holland company. The mine is leased: the lessees hire the mine, and work for one-half commission, the company milling the ore, which is low grade.

THE stage from De Lamar, Nev., to Milford, Utah, bimonthly, carries $60,000 bullion a distance of 160 miles, the run being made in thirty-four hours. An armed guard accompanies the treasure.

THE dissolution in the United States Court of the injunction secured by the Tyler Mining Company against the Last Chance enables the latter mine, one of the best in the Cœur d'Alenes, to start up again.

THE New Era Gold Mining and Milling Company has incorporated in this city. The directors are L. B. McMurtry, E. R. Wilson, H. R. Willis, G. Alexander, O. W. Schweitzer; capital stock $100,000, all subscribed.

THE Last Chance quartz mill, near Prescott, Arizona, was totally destroyed by fire last Monday night. The mill was in operation at the time of the fire, which originated from a spark from the smokestack. It will be rebuilt.

A. WARREN was killed in his mining claim on Rock creek, Plumas Co., last Saturday, by a tree falling upon him. His partner and himself had sawed through the tree and it fell in the opposite direction from which they expected.

AT the Golden Cross mine, fifteen miles west of Yuma, Arizona, the forty-stamp mill is working rich ore. The additional sixty stamps will be in operation in 90 days. The main shaft is now down 400 feet. The ore goes $15 on the plate.

THE Washington and Oregon Ore and Placer Gold Amalgamating Company has incorporated at Spokane, Wash., to introduce a new process for saving fine gold by means of fine screens of silvered copper wire. H. T. Mallon is secretary.

THE Keystone, Nev., mill and mine is the latest co-operative concern. The employes are running it, paying fair pro rata wages and paying off the company's debts. They say ninety days more will clear the property, and that it can be run at a profit right along.

WESTERN WASHINGTON papers severely criticise General Manager W. C. Butler of the Monte Cristo mine and Everett smelter. As he has been there but six weeks, it is in order for fair journals to give him time to gather the lines in his hands before criticising his driving.

THE Nelson *Tribune* wants the Dominion Government to raise the import duty on pig lead from $8 to $30 a ton. It says in that way only can British Columbia's silver-lead mining industry be developed. In Canada as elsewhere the tariff question appears to be a local issue.

O. W. SCHWEITZER has secured a six months' lease of the Kennedy, Nev., mill. He will take out all the machinery except the engine and stamps and try to work the ore by an electric process, which he claims will extract 90 per cent. He figures on beginning operations about Aug. 1st.

LAST DECEMBER F. E. Brightman was sent from a machine shop in Cleveland, Ohio, as general manager of the Gladstone mine, near French Gulch, Shasta Co. It was the first gold mine he had ever seen. He says he is doing all the clerical work, bossing the millmen, running $2 rock and paying expenses. Ten of the twenty stamps are in operation. There are very little sulphurets in the ore, and the chlorination works are not in use. Forty men are at work.

AT Grave Creek, near Grant's Pass, Or., last Monday, three men, Tracy, Auk and Dunham, appeared with rifles to jump a claim discovered and worked by E. and T. Browning, who warned them away. Tracy raised his rifle and advanced, when he was shot and killed by E. Browning.

THE Mineral Empire Mining and Investment Co. has incorporated in Butte, Montana, capital stock $262,000. The officers are: President, A. B. Keith; vice-president, W. E. Hollund of Chicago; secretary, R. S. Bickford; treasurer, John S. M. Neill. Mr. Bickford will open an office in Boston and Mr. Holland in Chicago.

AT the Ellery Bros.' mine, Dutch Gulch, Shasta Co., the quartz ledge varies from 6 in. to 2 ft., and averages $500 to the ton. The last 6 days' run cleaned up $2200. They have been offered $15,000 for the property, but claim they have $40,000 in sight. They have bought a one-fourth interest in the Saelzer, Fillman & Co. mine near Trinity Center.

AT the Brick Consolidated, in San Bernardino Co., ten stamps are crushing 17 tons per day, lack of water interfering with present operations. The shaft is now 540 feet deep. At Montgomery the Little Johnnie is turning out considerable bullion. H. Cannon, W. Langton and Orson Smith, of Utah, recently paid $75,000 for an interest in the latter mine.

THE Elkhorn, Montana, Mining Company report in May the mill worked thirty days; crushed 1194 tons; bullion produced in the mill, $25,757; nineteen tons of smelting ore sold, $1500; total produce, $27,257; total expenses, $22,433; estimated profit for the month, $4824. The directors declared an interim dividend of six cents per share for the three months ending May 31.

A TRANSPORTATION WAR is being waged by Bingham, Utah, mine owners against the Rio Grande Western. Believing that the railroad rate on ores to the Salt Lake smelters was unreasonable, the miners have put twenty four-horse teams to work and are marketing their ores by wagon transportation. With a lower ore rate, the output of that camp would be doubled.

TO DATE, Slate Creek, the new mining camp on the summit of the Cascades, has cost Marcus Daly of Montana over $50,000. The money was spent in shoveling snow, negotiating for the bonding of property, etc. Col. Hart was the negotiator; he is in Arizona at present. Some good prospects are reported in Slate Creek, which, properly developed, may prove valuable.

L. W. POPEJOY, of Denver, Col., has sued W. S. Stratton for a half interest in the latter's mines at Cripple Creek. He claims that he grub-staked the defendant, who discovered these mines in 1891, and that Stratton bought him out in July, 1891, for the amount of the grub-stake, and he only recently learned the value of the mines. The notice of the suit puts a lien upon fifty mines and town property in Colorado Springs, Victor and Cripple Creek.

WHAT, under the peculiar conditions, is said to be the fastest time ever made on a railroad in the United States, was recently run on the Santa Fe, Colorado Midland, and Midland Terminal, from Denver to Cripple Creek, Col., to bring a doctor to a sick miner there. The distance is 124 miles, and was covered in three hours and twenty minutes, counting in time occupied in making two transfers and stopping for water once. The time was 200 minutes, but when it is considered that the run was made over mountain roads, over highly graded curves, and other retarding influences, the run may be looked upon as phenomenal. From Denver to Colorado Springs the road winds about the broken country outlying the foothills, and as far as Palmer lake there is an uphill pull with a maximum one per cent grade for a distance of fifty miles. From that point to Colorado Springs it is down grade, and the distance from the Santa Fe yards in Denver to the station there is seventy-four miles. The conductor and the physician kept the time, and both timed the run, seventy-three minutes for the actual running time. At Colorado Springs another locomotive was in readiness and a quick transfer was made to the Colorado Midland, and the climb was commenced into the mountains, the hardest part of the run to be made. The road is built up a crooked canyon, and the prevailing grade is four per cent, and none less than three per cent. To Divide is a distance of twenty-eight miles. At that place a transfer was made to the Midland Terminal, having the same grade that prevails on the Colorado Midland, and a run of twenty-two miles made to Grasse, the Cripple Creek station. From the station to the cabin, where the miner was waiting the arrival of the physician, the distance was two miles. A carriage with two horses was in waiting, and over the mountain wagon road the driver landed the physician at the miner's bedside in ten minutes. Owing to the numerous and abrupt curvatures the engineer on the two last-named lines had to exercise caution, but the run the entire distance under the physical conditions is something most remarkable.

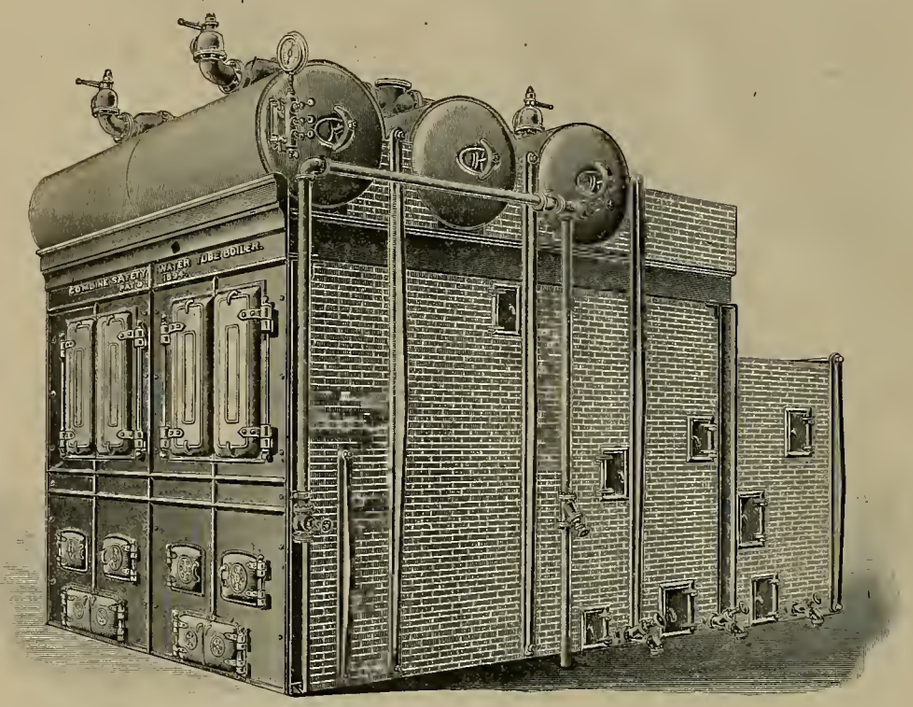
Obituary.

Thos. H. Huxley, the distinguished English scientist, died in London last Saturday in the 71st year of his age. Originally a surgeon, he took up the study of natural history and geology, and later in life, widened the area of his labors in general science. Like the late Prof. Proctor, he did much to make plain scientific truth, and popularized many of the theories and facts that he advocated. His writings were voluminous and in nearly every respect resulted in adding to the sum total of organized knowledge and general information. On evolution and kindred topics Prof. Huxley was an acknowledged authority. He is credited with having originated the term "agnostic," which defines that numerous class who neither deny nor affirm alleged religious truths, saying in effect, "I don't know." He occupied about the same place in the scientific world that our Prof. Davidson does. Unlike him, however, the British Government delighted to honor itself in doing him honor, and his great services and preeminent ability received fitting recognition throughout.

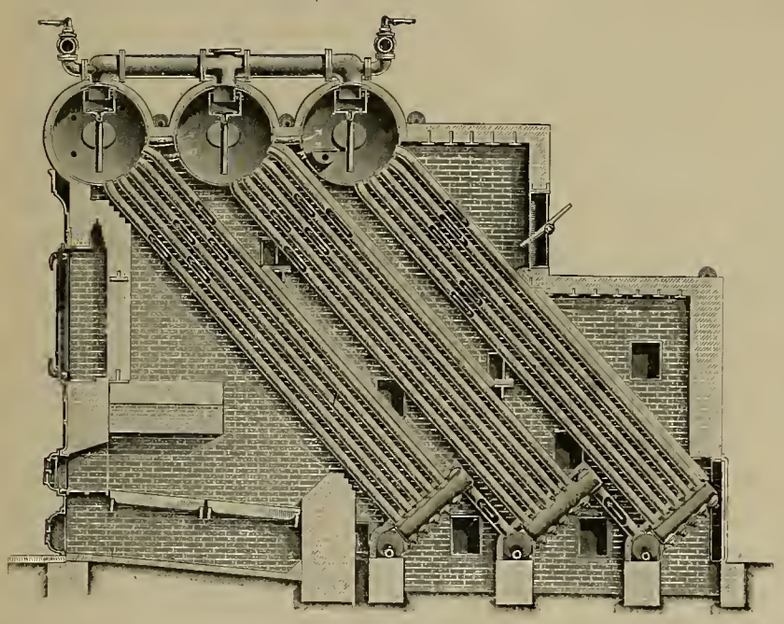
Prof. Huxley was devoid of veneration. He was not content with believing that anything was so, simply because some one else said so or saw it stated in some book. He investigated, sought Nature direct through its workings, was never content to know that a thing was so till he knew why; what made it so and how, and, as usual, incurred considerable censure from those whose comfortable conclusions he disturbed. He did service to mankind in general, and fully deserves the honorable remembrance in which his memory will be held by all thinking people.

Combine Safety Water Tube Boiler.

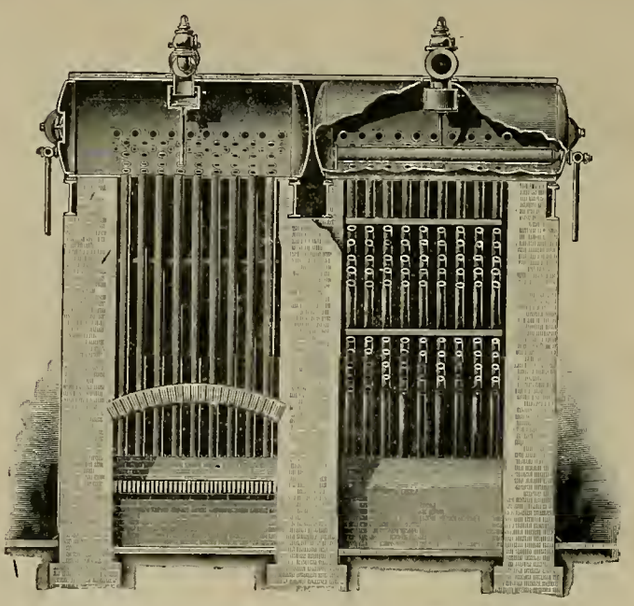
The water tube boiler illustrated herewith is patented and manufactured by L. M. Moyes, 411 and 413 Walnut street, Philadelphia. The boiler is sectional and of the class of the water tube type in which the steam and water drums are arranged and located transversely to the flow of gases from the furnace to the outtake to chimney. Mr. Moyes makes a very broad claim of continuous and positive circulation throughout the entire boiler system. The cuts show a perspective elevation of a battery of 616-horse power, a side elevation, showing an assembled boiler, transverse sections through the front steam and water drum and furnace and through the rear steam and water drum. The other figure shows a detail of tubes, manifolds and distributing drums assembled. The side elevation presents a good idea of the arrangement of the boiler; the tubes (standard 4 in. by 18 ft.) on an angle of about 45 degrees are expanded at the upper end into the tube sheet in steam drum, and the lower end into the tube seats in manifolds. The sections are connected to and with each other by circulating tubes set at the same angle as the tubes, and are five inches in diameter, each distributing drum having a separate blow-off valve. In operation of the boiler the gases, as will readily be seen, have a long contact with the heating surfaces in their flow from furnace to outtake. The circulation of water and flow of steam generated in the tube is upwards in the two forward sections into the two front drums, with ample disengaging space, thence by the connecting devices to the rear drum (into which the feed is also being delivered) downwards in the rear section to supply by the many connections the water of displacement. The connections between sections provide for all and every possible strain of expansions. The steam drums rest on I beams in such a manner as to remove all carrying



PERSPECTIVE ELEVATION—TWO BOILERS IN BATTERY.

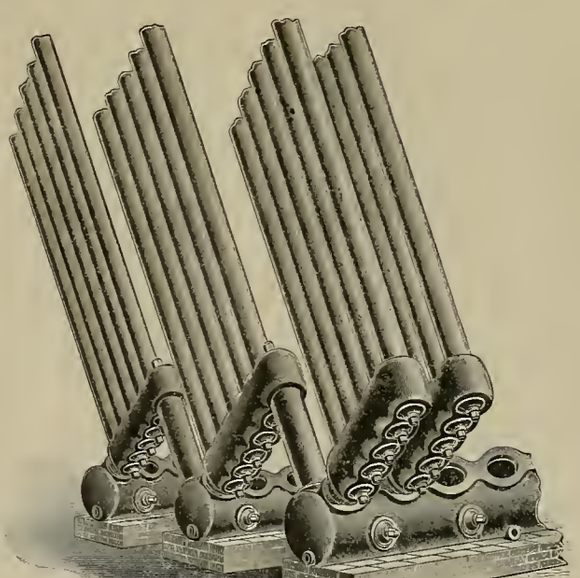


SIDE ELEVATION.



TRANSVERSE SECTIONS, THROUGH STEAM DRUMS.

strains from the tubes. The circulating and compensating tubes by which the steam drums are connected are shown in the side elevation, also the cross steam pipes on top of the drums, to which are attached safety valves. These cross pipes are of steel, with flanges cast on. Forethought is displayed in the facilities for the removal and replacement of damaged tubes. A tube from any section in the boiler can be easily removed without interfering with the adjoining tubes. The removal of a deposit from the inner surface of tubes is effected either by introducing the scraper at the lower end through the hand-hole or at the upper end from the steam drum. The smallest steam drum used on this boiler is forty-two inches in diameter, giving ample space for men to operate when cleaning tubes. The chamber at the lower end is also sufficiently roomy for the cleaning. The facilities for cleaning tubes have been based on the practice of many years' experience with this type of boiler. A specially designed scraper and handle is used. The cut of detail shows the manner of connecting the tubes to the manifolds, also the connections between manifolds and distributing drums. The hand-holes shown in distributing drums are covered and protected in the same manner as those in the manifold; the same fittings are used in both cases. There seem to be no departures from the established lines of the standard boilers of the water tube type. The assemblage of heating surfaces, the building up of the same with standard tubes, drums and manifolds, and their relation to each other, the travel of gases in contact with heating surfaces, the circulation of water and flow of steam are identical in their dispositions as in the better known boiler with which Mr. Moyes was for so many years connected. The boiler herein illustrated and briefly described is built in units ranging from 50-horse power to 600-horse power, and is capable of carrying a working pressure up to 200 pounds per square inch.



SECTION OF DETAILS.

In the great new American steamship St. Louis, which promises to be the forerunner of a magnificent fleet of American-built and American-devised trans-Atlantic liners, there are fully 1000 tons of piping of various kinds. The condensers pump 50,000,000 gallons of cooling water a day. The furnaces consume 7,500,000 cubic feet of air an hour. The boiler tubes, if placed in a straight line, would stretch nearly ten miles and the condenser tubes more than twenty-five miles. The total number of separate pieces of steel in the main structure of the ship is not less than 40,000, and the total number of cubic feet of timber used in the construction is more than 100,000. The total number of rivets is not far from 1,250,000. A marine engineer estimates that in a ship of this size, if all the steel which composes it were made into needles and placed in a line, they would reach more than ten times around the earth, or the distance to the moon, 240,000 miles. Another expert has estimated that if the ship were propelled by galley oarsmen, as in ancient times, it would require a force of 117,000 men continuously at work to develop the same power that the engines of this ship will produce.

Asbestos packing for valve stems and similar purposes is much improved for use by oiling it well with cylinder oil before putting it into place.

Treatment of Roasted Gold Ores by Means of Bromine.*

By RICHARD W. LODGE.

Mr. H. R. Batcheller, of the class of 1894, Massachusetts Institute of Technology, while experimenting with chlorine gas on a certain lot of roasted concentrates, met with the following difficulties: 1. A poor extraction of the gold. 2. A very large consumption of chlorine gas. 3. Inability to precipitate all of the gold from the solution containing the $AuCl_3$. 4. The bullion obtained was very base.

These difficulties were the same whether the chlorine was generated from H_2SO_4, MnO_2, and salt, or whether H_2SO_4 and bleaching powder were used. They may be accounted for partly by the presence of some arsenic left in the roasted ore, and partly by the presence of copper in the solution containing $AuCl_3$.

It was therefore suggested to try the effect of bromine on a similar lot of ore. The use of this element is, of course, nothing new, but in the following experiments it seemed to present many advantages over chlorine.

The material worked upon consisted of some concentrates containing 2.31 ounces of gold per ton, and 34.26 per cent of arsenic, which would correspond to about 74.4 per cent of arsenopyrite. Considerable pyrite and a small amount of galena and chalcopyrite were also present.

The material, when sized and assayed, showed:

	Per cent.	*Ozs. gold per ton.*
On 24-mesh sieve	.7	assaying 1.4
" 30 "	1.9	
" 40 "	3.5	" 1.2
" 50 "	6.0	
" 60 "	4.5	" 1.12
" 80 "	11.0	" 1.19
" 100 "	26.0	" 1.4
Through 100-mesh sieve	45.0	
Loss	1.4	
	100.0	

The line of treatment was as follows:

1. Roasting the concentrates in a reverberatory furnace.

2. Submitting the roasted ore to bromiuation in strong preserve jars, "lightning brand," with double gaskets, the jars and their contents being revolved during the experiment.

3. Precipitation of the gold by means of H_2S:

ROAST I.—TIME, FIVE HOURS.

	Kilos.	*Assay. Ozs. gold.*
Raw ore	10	2.31
Roasted ore	6	3.36
	Per cent.	*Per cent.*
Loss	40	12.7

BROMINATION.

Roasted ore	500 grammes.
Bromine	14.5 c.c.
Water	500 c.c.
Time	5½ hours.

Assay of tailings from two tests gave 0.30 and 0.32 ounces of gold. Based on the roasted ore, this would be an extraction of 90.7 per cent.

ROAST II.—TIME, EIGHT HOURS.

	Kilos.	*Assay. Ozs. gold.*
Raw ore	15	2.31
Roasted ore	8	4.20
	Per cent.	*Per cent.*
Loss	46.67	1

The following experiments were made to determine the proper amount of bromine for 500 grammes of ore:

Roasted ore. Grammes.	*Bromine. C.C.*	*Time. Hours.*	*Water C.C.*	*Extraction, based on assay of tailings. Per cent.*
500	3.0	5½	500	90.67
500	3.0	5½	500	89.27
500	1.5	5½	500	92.54
500	1.0	5½	500	81.35
500	0.5	5½	500	62.23
500	0.3	5½	500	60.00

The following were made to determine the shortest period of contact of ore and bromine, giving a good extraction:

Roasted ore. Grammes.	*Bromine. C.C.*	*Time. Hours.*	*Water. C.C.*	*Extraction, based on tailings. Per cent.*
500	1.5	5½	500	92.54
500	1.5	4½	500	88.00
500	1.5	3½	500	86.00
500	1.5	2	500	81.35
500	1.5	1	500	72.02

These tests seem to indicate that 1.5 c.c. of bromine, added to 500 grammes of ore in 500 c.c. of water, would effect in five and one-half hours an extraction of over 90 per cent of the gold in the ore.

To test these conclusions, a third roast was made:

ROAST III.—TIME, EIGHT HOURS. ORE COOLED IN FURNACE.

	Kilos.	*Assay. Ounces.*	*Arsenic. Per cent.*	*Sulphur. Per cent.*
Raw ore	70	2.31	34 26	
Roasted ore	43.7	3.58	0.11	0.34
	Per cent.	*Per cent.*		
Loss	37.6	3 3-10	99.67	

Of this roasted ore 15 kilos were treated with 45 c.c. of bromine in 15 kilos of water for four and one-half hours in a revolving keg. The tailings showed an extraction of 85.5 per cent.

As an exeess of bromine was present when the keg was opened, at the end of four and one-half hours, a second experiment was tried with ore, 15 kilos; bromine, 35 kilos; time, five and one-half hours; water, 15 kilos.

This showed an extraction of 92.18 per cent, based on the assay of the tailings. The actual gold recovered from the solution was only about 80 per cent, which may be accounted for by the presence of considerable copper in the solution.

The expulsion of the bromine from the solution seemed to be best brought about by means of SO_2. Air and steam were both tried, but with poor success. After the passage of SO_2, the solution was quite clear, although some gold would be precipitated on standing.

When the ore was chlorinated, the solution at this point, containing the $AuCl_3$, would be quite turbid, and evidently contained a large amount of base metals as chlorides. These would necessarily interfere with the complete precipitation of the gold, besides making the bullion base. Some base metals, such as copper, were also present in the bromine solution, but apparently not to such an extent; for the solution was clear.

The gold was finally precipitated by means of H_2S.

In the experiments on this particular ore, bromine seemed to have the followiug advantages over chlorine:

1. It extracted a much higher percentage than chlorine; the results being estimated, not only on the assay of the tailings, but also on the actual gold recovered.

2. It gave solutions much more free from base metals. This would be expected, especially where chlorine is generated by means of H_2SO_4 and bleaching powder, and the acid has a chance to act directly on the ore.

3. Less time is required to extract the gold.

4. The ease in using and comfort in handling is much greater.

As regards the comparative cost, the least amount of bromine which could be used on this ore with a successful extraction, appeared to be 0.3 per cent, or six pounds per ton. With bromine at 25 to 40 cents per pound, this would make the cost very high; but the cost of chlorination would certainly be still higher, as it was found necessary to use as high as ten per cent of lime and six per cent of H_2SO_4 to obtain even a fair extraction.

* Read at the Florida meeting, March, '95, of the American Institute of Mining Engineers.

The Present Limitations of the Cyanide Process.*

By C. W. MERRILL.

The cyanide process in the United States, notwithstanding uumerous failures made under the direction of the owners of the patent rights and others, has now passed its experimental stage, and can, undoubtedly, be made successful when intelligently applied to suitable material.

Much, however, remains to be known as to the exact conditions under which this process is applicable to the treatment of gold-bearing ores. If the owners of the patent rights in this country have ever scientifically investigated the matter, they have never published any valuable information on the subject. Other parties who are now using the process (often independently of the patentees) have nothing to gain by publishing their experience; and, moreover, many of the chemical reactions described in the text-books refer to the use of solutions of potassium cyanide many times stronger than are used in the metallurgical process.

I have, therefore, ventured to outline iu the following paper some conclusions from laboratory and field investigations, hoping thereby to induce others to communicate their knowledge, and thus to give new light upon certain points which are as yet unsettled; also to call attention to matters which should be kept in view in considering the treatment of ores by this method; and, finally, to add what little I can to the knowledge now extant upon the subject.

Unless otherwise specified, the term ore, as used in this paper, will signify either ore or tailings.

The consideration of ores of which the silver forms an important factor of their value will be omitted, although there are good reasons for believing that, with some modifications, certain silver and silver-gold ores can be successfully treated.

Ores containing coarse gold, which is not easily soluble in potassium cyanide, should always have that portion of the gold extracted by concentration or amalgamation before leaching. This precaution being observed, out of some fifteen gold ores on which I have experimented not one has been found in which more than twenty-five per cent of the original value was left in the tailings after leaching with a solution of potassium cyanide. In some cases less than five per cent so remained, the average being about fifteen per cent. But often the decomposition of cyanide of potassium was so great as to prohibit the application of the process. The assertion of the patentees, which forms the basis of their original United States patent, to the effect that solutions containing cyanogen in a proportion not exceeding eight parts of cyanogen to 1000 parts of water (which is equivalent to a two per cent solution of potassium cyanide), will dissolve gold and silver in the ore, while leaving the base metals practically intact, is contrary to the fact, as a solution containing as little as one-half of one per cent or less of potassium cyanide will dissolve compounds of some of the base metals, and especially of copper, zinc and manganese, with the greatest facility.

Of the ores unsuited to this process, some are so for chemical reasons. Of these cupriferous ores are especially to be mentioned. The great affinity of all copper minerals (save possibly the silicate, the phosphate and native copper) for cyanogen is the cause of a large consumptiou of cyanide of potassium, which is an expensive reagent. A means of recovering the cyanogen thus rendered useless has not as yet been devised. A few figures will illustrate this large cousumption. One pound of copper will combine with a little more than two pounds of potassium cyanide to form the double cyanide of copper and potassium; therefore, if an ore contains as little as one-half of one per cent, or ten pounds per ton of copper, in a mineral form which is soluble iu the solution used, the amount of cyanide of potassium rendered useless will be more than twenty pounds, costing, at fifty cents a pound, more than ten dollars.

The same line of reasoning applies to oxidized zinc-bearing ores, but the affinity for cyanogen does not seem to be as great in zinc minerals as iu those of copper.

The consumption of potassium cyanide occasioned by the presence of certain compounds of iron and manganese can sometimes be obviated, to a great extent, by mixing lime with the ore; but at other times there is, in leaching partially oxidized pyritic ore, a consumption of potassium cyanide which the use of lime will not overcome. There is no precise information available as to the mineralogical or chemical conditions under which these differences occur.

Other ores offer difficulties because of their physical nature. This is the case with ores naturally soft and slimy, and yet not porous enough to give a good extraction when crushed coarse By fine crushing these are rendered so impermeable to the solution that successful leaching is impossible.

Similarly, the treatment of slimes which have become segregated from the sandy constituents of the ore has not, as yet, been solved in a practical manner.

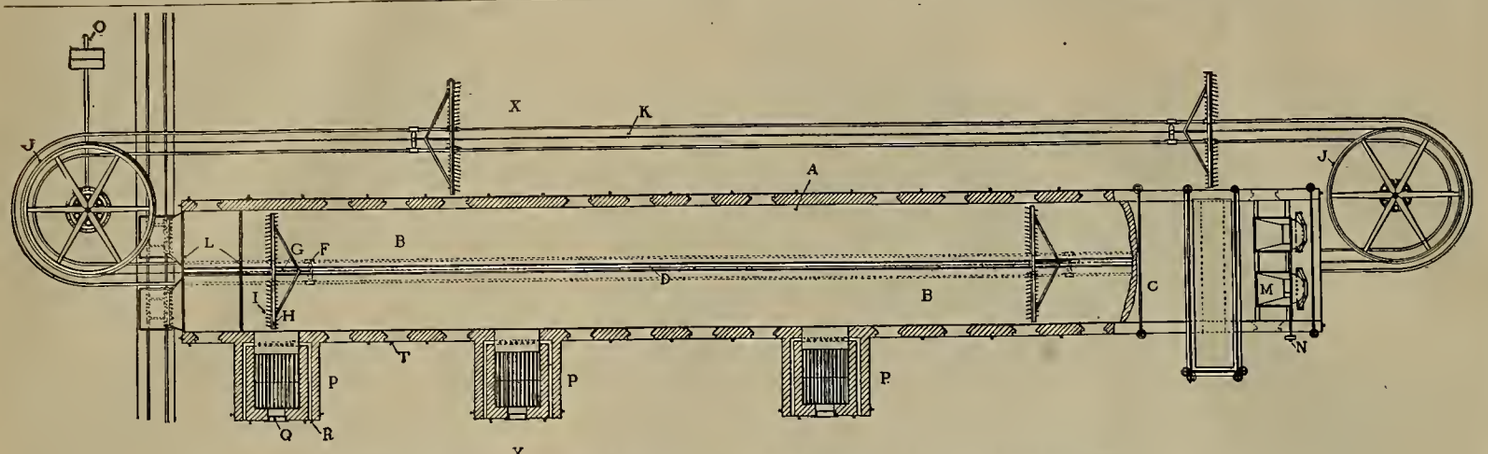
Furthermore, there is a class of roasted material in the roasting of which the temperature was so high as to fuse the minerals in which the gold occurs, thus so imprisoning the gold as to render it incapable of being dissolved by the cyanide solution.

Coming now to the, as yet, undetermined class of ores, trustworthy information from continuous working of large quantities is still lacking in regard to the behavior toward cyanide solutions of ores containing galena, zinc-blende or oxidized lead compounds, also of telluride ores and unoxidized pyritic ores. Their adaptability to the treatment will depend, in the first place, upon the condition in which the gold is present (whether distinct from the base metals or chemically or intimately combined with the latter), and, in the second place, upon the solubility of the base metals in a solution of potassium cyanide of a strength sufficient to extract the gold. Where this solubility exists to any great exteut the consumption of potassium cyanide will render the process unavailable. Moreover, the solubility of the base metals entails other evil effects besides the chemical loss of potassium cyanide. As the solution becomes fouled by their presence, its extractive power becomes weakened, even though the normal percentage of active cyanogen be maintained by the addition of fresh quantities of potassium cyanide. Again, the gold and silver contained in solutions of this kind are imperfectly precipitated in contact with metallic zinc. The zinc filaments used in practice for precipitating the precious metals become incrusted with a deposit which prevents their further action to such au extent that, as has happened in a large plant erected for the cyanide process, the solution, after it has been used on the ore a few times, will flow out of the zinc boxes almost as rich as it went in, causing, with other difficulties in the treatment, the failure of the process.

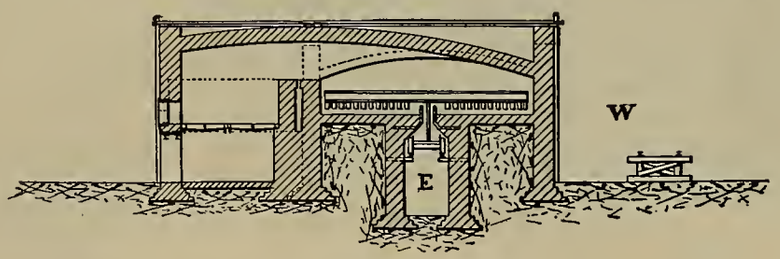
The class of ores suitable for this process comprises all oxidized ores which are not included in the above classes, also roasted tailings from which the coarse gold has been removed, and which do not contain such compounds of the base metals as will consume too large a quantity of potassium cyanide; and, finally, strictly quartzose or siliceous ores in which a considerable quantity of fine gold remains after amalgamation. A small percentage of pyrites in such cases will not prove an insurmountable objection.

In conclusion, it may be said that, as far as known at present, only those ores can be economically treated which will readily yield a fair percentage of their gold contents to the action of weak solutions of potassium cyanide, and which contain no appreciable quantity of base-metal compounds soluble in such weak solutions. While strong solutions will extract a high percentage of the value from a much larger class of ores, no method has as yet been made known

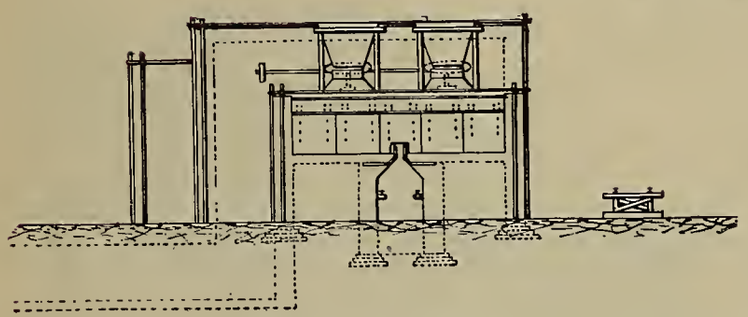
*Read at the Florida meeting, March, '95, of the American Institute of Mining Engineers.



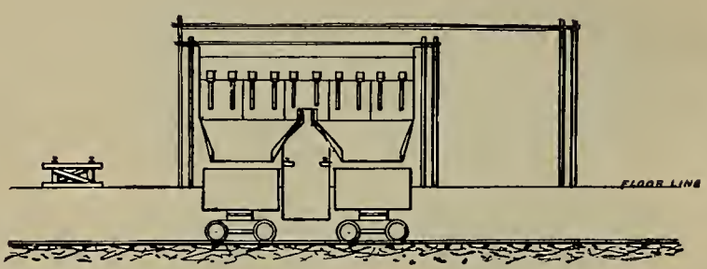
PLAN OR HORIZONTAL SECTION OF THE ROOP STRAIGHT-LINE FURNACE.



SECTION THROUGH X-Y.



FEED END OF FURNACE.



DISCHARGE END OF FURNACE.

(*See First Page.*)

for overcoming the excessive chemical consumption and the consequent fouling of the solution accompanying their use.

In deciding upon the application of the cyanide process to the treatment of a new ore, it is therefore not sufficient to know, in a general way, tbat a high percentage of the gold is soluble in potassium cyanide. The minimum strength of solution which will be required to obtain satisfactory results, and the unavoidable loss of potassium cyanide by chemical decomposition, should be carefully ascertained by laboratory tests, as well as the permeability of the crushed ore to the leaching solution. An investigation should also be made to determine the ability of zinc to precipitate the precious metals after continued use of both the solution and the zinc.

The Necessity for Competent Geological Surveys of Gold Mines.

On the 14tb ult., Nicol Brown, F. G. S., read a paper with the above title at a meeting of the Geologists' Association of London, in which he said that geology in competent hands is the first science for gold mining, and that no sure foundation is laid for other sciences to base their work unless the preliminary work of the geologist be well done. Whether a man goes to seek fossil shells or golden sands the same qualities are required for success, the same iutimate knowledge of nature and nature's laws, without which ber thrilling secrets cannot be discovered. From the want of this knowledge the ordinary uninstructed gold seeker always defeats the end he has in view. He works hastily and by imperfect methods, aud never stops to mark the finger posts or compass points which might guide him to the object of his search. The finding of gold must uo longer be left to chance, but should be the result of well-designed and well-organized efforts, and the basis of that industry, which is now being built up, rests ou geological surveys made by qualified men. These are now demanded and must be obtained, and the gold miners can well afford to pay for them, and at a different rate from what bitherto has been paid.

Directors of gold mining companies have considerable difficulties to encounter in selecting employes who understamd the various departments of the work. To the uninitiated these latter appear complicated; but in reality they are simple to those who take the trouble to spend the time and labor to learn about them. Directors of gold mining companies should, however, themselves learn how to appoint their staff, and to control them by allocating to them tbeir work in such a way as to get the best results. Instead of this, their aim has been to get what they call an "all-around" man, and thus try to shift the respousibility off their shoulders. Owing to the confusion existing in the minds of such unskilled persons as to the proper administration of gold mines, the work of the different departments has often been hopelessly mixed. By these persons the manager is expected to be a geologist. a miner, a mechanic, a chemist, and a business administrator, all rolled into one; but evidently this leads to failure. Psuedo-geologists, without adequate knowledge, have been often employed to survey and report on the properties. Incapable persons also have been entrusted to do the industrial part of the work of mining, milling, and saving the gold. All this blundering results in heavy loss. So largely has this been the case from the earliest times, that those who have taken the trouble to inquire into the facts, taking good and bad mines alike, have often made the statement that gold costs more to produce than it is worth. Proper geological surveys, not only of the gold-bearing veins or beds, but of the enclosing rocks, must now take place of the old prospector's empirical work in order to prepare the field for the tools of the workers of the mines, who cannot otherwise proceed intelligently with their operations. The costs of preliminary and concurrent surveys by competent geologists should always be provided for in any gold mining scheme. The expense of such surveys will be infinitesimal, compared with the money thrown away in times past on many expensive, abortive, El Dorado-like schemes.

The mining operations should be uuder the control of an educated and experienced mining superintendent. He must be a practical miner, and should have had experience in mining various ores in different parts of the world. It is a great disadvantage to employ a miner whose prejudices have been developed by long experience in one particular series of rocks or of the physical structure of one country. Such a man, bowever capable otherwise, has no resources when he comes to deal with new geological conditions. Unfortunately, many good mines have been condemned by such men. The various methods of gold mining naturally depend on the formation of the gold-bearing rocks. The operations oftcn reveal sections of the earth's crust, which, when noted by the thoughtful geologist, lead to further following up of the payable deposits; if, however, these sections are left unnoticed and unrecorded, rich opportunities are thrown away.

Having "torn up the mountains by the roots," as mining was described in the book of Job, and brought the ore "to grass," the next operation is to mechanically crush it, in order to free the gold from the gangue; there is no evidence of this operation having been attempted by the ancients. The stone-breakers, mechanical hammers and various crushing appliances of all kinds do on an artificial scale what the earth movements, the sea, ice, frost and rivers have always done with the rocks on a natural scale. The California stamp mill for crushing the ore is an improvement in detail and adaptability on the old Cornish mill used in tin stamping, whicn has been in vogue since the seventeenth century. By these stamp mills, which are at present the chief means of crushing, the ore is reduced to a fine state of subdivision, and the battery is flushed with water to act as a carrier of the finely-divided ore or pulp from under the hammers. The pulp is carried over plates coated with mercury, which catches a certain amount of gold, and so saves it in the form of an amalgam of gold and mercury. The general result of this treatment is great loss in float gold, and loss of gold in slimes. A newer method, which is now attracting much attention, but may not be applicable to all kinds of ores, is to crush the ore dry, and this makes the product easier to deal with, when a percolation chemical process is used for dissolving the gold out of the ore, instead of taking it out by amalgamation with mercury.

The lecturer said that it was his aim to show that the chance of men finding much gold in massive nuggets, and becoming suddenly rich, has forever vanished. To continue the necessary supply of gold to carry on the ever-extending commerce of the world,

a vast industry of the first importance, aided by many sciences, is needed to gather out the infinitely small scattered portions of gold as they exist in Nature. The product in gold of the industry which has recently sprung up will afford relief to the straightened currency of the world; and as it can now be produced with industrial and scientific certainty, the result to the world will in the near future be very great. Men cannot now-a-days keep slaves to work their gold mines as of old; but, always provided that they work upon the basis of proper geological surveys, the mining, the mechanical, the electrical engineers, and the metallurgical chemists, with all the far-reaching fingers of their various sciences, can gather out the countless small particles of gold from the rock matrices. Industry must be set off against industry; our future gold, got by well-directed industry, will represent the result of honest men's toil.

Annual Mint Accounting.

The following is from the San Francisco *Chronicle* of the 3rd inst.:

The annual accounting and department settlements at the United States Mint in this city was begun yesterday. This important work, involving millions of dollars, is annually supervised by special agents appointed by the Director of the Mint. The agents designated for this work this year are J. Farley Wilder and H. W. Van Sendem. The former is assayer of the New York assay office, and began the ordinary detail work yesterday. Mr. Van Sendem is the private secretary to Secretary Carlisle, and is expected here in a few days. Superintendent of the Mint Daggett, who has been out of the city since June 8th, reached home from Siskiyou county on Monday in time to meet these special agents.

The year, which ended at midnight on Sunday, was a very active one in the local mint. The total coinage aggregated 8,401,011 pieces, of the value of $24,920,110.25. Of this 1,147,450 pieces were gold, of the value of $21,395,500, and 7,258,561 pieces in silver, of the value of $3,524,610.25. The report just rendered by the coiner would indicate that the popular notion that the coinage of standard silver dollars had been suspended is entirely erroneous. It shows that 1,600,000 of these dollars were coined during the past year. The detailed statement of the work of the coinage department for the fiscal year just closed is as follows:

Compared with past years this shows a considerable increase over the year 1893-94 in both silver and gold, and also over 1892-93. In the latter year only $1,284,000 was coined in silver, as against $3,524,610 for the year just closed. In 1893-94 only 4,739,000 pieces were coined, as against 8,401,000 pieces for the year just closed, indicating double the amount of work. The increase in the coinage of standard dollars is exceptionally large. In 1892-93 but 700,500 were coined; in 1893-94 none whatever, as against 1,600,000 last year. A telegraphic report just sent out from Washington states that, in the month of June, the coinage executed at the several mints was: Gold, $1,750,000; silver, $440,044; minor coins, $71,200; total, $2,261,244. During the month the San Francisco Mint turned out $1,670,000 in gold, or nearly the entire product of the country; and $160,000 in silver, about one-third of the total silver coinage.

The business of the Mint is not conducted on a basis of the face value of the coins produced, but by ounces wholly. The chief coiner receives from the melter and refiner standard ingots, from which coin is to be manufactured in conformity with the standard weight provided by law.

Denomination—	*Pieces.*	*Value.*
Gold.		
Double-eagles	1,083,800	$20,716,000 00
Eagles	24,250	242,500 00
Half-eagles	87,400	437,000 00
Total gold	1,147,450	$21,395,500 00
Silver.		
Dollars	1,660,000	$1,660,000 00
Half-dollars	2,536,880	1,268,440 00
Quarter-dollars	1,936,681	484,170 25
Dimes	1,120,000	112,000 00
Total silver	7,253,561	$3,524,610 25
Total coinage	8,401,011	24,920,110 25

The operations in gold workings apply in the main to those of silver, and in the process of rolling, cutting, milling and cleaning to the base coinage also. The latter includes nickels and pennies, which are not made here. The gold ingots, after they are received, are taken to the rolling room, each melt being kept separate. The first process is that of reducing the ingots to strips or fillets of a proper thickness. Eight drafts are had upon the rolls previous to annealing and three subsequent. The strips are then reduced to a proper thickness for the next operation, which is upon the draw bench. The annealing of the gold fillets is done in copper cannisters, rendered air-tight by potters' clay. When the cannisters have been taken from the furnace they are placed in water to cool. After the fillet is cut and annealed a second time it is pointed with the pointing rolls and is then ready for the draw bench. When the fillets have been scientifically reduced, a few planchets are cut from both ends of a fillet and weighed. These testings are continued until the planchets so produced conform to the working tolerance, which is from standard to one-quarter or three-eighths of a grain heavy. The fillets then pass to the cutters, and when the planchets are cut they are sent in lots of $15,000 to the adjusting room. The planchets are delivered to each adjuster in small tin pans, numbered to correspond with the seat occupied by the female adjusters, each adjuster receiving about 250 planchets at a time. In front of each adjuster stands a delicately adjusted balance, sensitive to the one sixty-fourth of a grain weight. All planchets that deviate beyond the allowance shown in the foregoing table are rejected as "condemned lights," and the remaining are separated into "lights" and "standards," to be united in proper proportions with the "heavies." When again adjusted the planchets are weighed with the filings and the loss carefully noted. Perfect record of all wastage is kept in every department through which the coin passes.

From the adjusting room until the planchets are returned to the weigh room as coin the lights, heavies and standards are kept separate. These are then united by the chief weigher in drafts of $5000 so as to give in delivery a uniform standard of 268.75 ounces troy for each draft of gold. If the further tests prove satisfactory the chief coiner notifies the treasurer that the given amount in a given denomination of gold is ready for delivery. The trial pieces are placed with a memorandum stating date, amount and character of the delivery in a linen envelope with the seal of the assayer. This envelope is placed in a secure box called the pyx, to which there are two keys, one being kept by the treasurer and the other by the assayer. This pyx is kept sealed until the annual assay, when it is opened by the commissioners appointed by the Director of the Mint to examine into the accuracy of the work for the year previous.

This is the work which Messrs. Wilder and Van Sendem are to perform in connection with other duties. Pending the annual accounting all business at the Mint is suspended, sweepings are carefully treated and assayed, and the gold and silver are accounted for within a fraction of a grain. The work is an important one, and usually causes commotion among the Mint employes, entailing on all the hardest labor for the year.

The pieces coined really tells the work done by the mints. It costs almost as much labor to coin a silver ten-cent piece as a twenty-dollar gold piece. The following table gives an idea of the relative labor involved in coinage, all coins being packed in standard, full boxes:

Denomination.	*Pieces to full boxes.*
Gold.	
Double eagles	1,000 pieces
Eagles	2,000 pieces
Half eagles	4,000 pieces
Silver.	
Standard dollars	1,000 pieces
Half dollars	2,250 pieces
Quarter dollars	4,500 pieces
Dimes	11,000 pieces

The following is the standard table now in use in the mints of the country as the weights of a given amount of coin:

Amount.	*Weight, Ounces, Dec.*
GOLD.	
$ 20	1.07½
5,000	268.75
10,000	537.50
20,000	1,075.00
30,000	1,612.50
40,000	2,150.00
50,000	2,687.50
SILVER.	
Silver Dollars.	
$1,000	859.375
10,000	8,593.75
20,000	17,187.50
40,000	34,375.00
50,000	42,968.75
Half-Dollars, Quarters, Dimes.	
$1,000	803.75
5,000	4,018.75
10,000	8,037.50
20,000	16,075.00
30,000	24,112.50
40,000	32,150.00
50,000	40,187.50

It will be noted that there is considerable discrepancy in weight between $1000 in standard silver dollars and $1000 in half-dollars. This is due to the act of 1853, under which subsidiary coin is made. At that time silver was comparatively high, and foreign Governments drained it out of the country. To stop exports the standard was lowered, and has remained there ever since.

Coast Industrial Notes.

—The Pacific Rolling Mills have a contract to supply 30,000 fish bolts for the Valley road.

—A prune crop of 10,000,000 pounds is the estimate for Oregon, Washington and Idaho this season.

—Last week's big fire in this city entailed a loss of $800,000. The insurance aggregates about $300,000.

—The Golden Gate Woolen Mills have a government contract for 6000 blankets, to be sent to Philadelphia.

—H. D. Morris & Co. have placed a 14x22 Rand compressor and drills for the Merced G. M. Co. at Coulterville.

—The Puget Sound Lumber Association advanced the price of cedar lumber $1 to $3 per thousand feet for rail shipments.

—The Joshua Hendy Machine Works are putting in a double steam hoisting engine, boiler 60 in. by 16 ft., at the Standard mine, Oregon City, Butte Co.

—The Juneau *Mining Record* advocates the regulation of salmon fishing, and thinks that if something is not done soon the great Alaskan industry will suffer irretrievable injury.

—The entire output of quicksilver of the United States is mined in California, the total quicksilver product of this State to date amounting to 1,700,000 flasks, valued at $80,000,000. California produces about 40,000 tons of asphaltum, or 90 per cent of the total product of the United States, annually.

—The Pacific Shoe Company adopted the profit-sharing plan. The employes, in addition to the wages they receive, share in the profits of the business. The company employs about thirty persons.

—Two extensive lime works are constantly at work on San Juan island. One runs three kilns and turns out 120 barrels each day on an average. The other runs two kilns at present, and produces about the same amount.

—Since February 1st 5420 carloads of fruit have been marketed by the southern California fruit exchanges; of these 90 per cent have been oranges. It is estimated that the orange crop for this year has brought $1,850,000 to the growers.

—C. N. Beal, Bakersfield, Cal., representing the Power Development Company, asks for segregated bids for the electric plant to which previous detailed reference has been made. The bids are all to be in August 1st; the contract to be let September 15th.

—The Nevada County Electric Power Company have contracted for an electric plant of sufficient capacity to deliver 800 H. P. at Nevada City. Besides furnishing power to 50 or 60 mines, it is intended to build an electric railway between Nevada City and Grass Valley.

—In the suit of the U. S. Government against the Leland Stanford estate for $15,000,000, Judge Ross last Saturday decided that the C. P. stockholders or owners were not individually liable to the Government for the debts of the road, and sustained the demurrer, a defeat for the Government. An appeal will be filed forthwith.

—The cruiser Olympia, built by the Union Iron Works, was inspected during the last ten days by the United States Naval Board and after a rigid test pronounced thoroughly satisfactory, which effectually disposes of the rumors of top-heaviness, etc., which were given in the eastern and some coast papers. The Olympia goes to Mare Island next week to await orders.

—Bishop T. Taylor, of Cedar City, Utah, offers to manufacture all of the steel rails, spikes, fish plates, switches and other appliances necessary for the new railroad lines from Durango (Colorado), Flagstaff, Phœnix and Yuma to San Diego, at the iron works at Cedar City, from iron made from ores taken out of the mines at that place, and with coal mined there; and also to furnish 1,500,000 tons of good coal per annum, delivered on board of the cars at Cedar City, for $1.50 per ton.

—At Harbor View last Sunday, R. T. Rolfson gave exhibition of a test of his new gas engine, which, so far as known, is the first one of the kind built. It is reversible, the crankshaft connected direct with the propeller shaft without any intermediate gearing in marine use. The new engine will be put into the Albert R., now building at Sausalito, and its workings will be of interest to many who have given considerable thought to the idea to which Mr. Rolfson claims to have given successful result.

—It is announced that A. A. Robinson, president of the Mexican Central Railroad, has resumed the presidency of the Atchison, Topeka & Santa Fe, and that he is to receive a salary of $60,000 a year, which is $25,000 more than he has been receiving from the Mexican Central Company. He returns to the Santa Fe with the understanding that he is to have full management of the property, and that all his decisions and acts in regard to all traffic and financial affairs of the property must be final and not interfered with by the board of directors.

—George Ames, of the Union Iron Works (who recently closed a contract with the Anaconda Company to furnish two of the largest hoisting engines ever constructed for use in two of the syndicate mines, of the latest pattern and capable of sinking 6000 feet), has a contract to furnish the refinery at Anaconda with two of the largest engines ever constructed—triple expansion Corliss engines, with a rating of 900-horse power each. The company will also furnish three mammoth steam stamps and several Bruckner furnaces, the whole amounting to about 700 tons of machinery, requiring thirty-five railroad cars for transportation.

—The *Railway Age*, being duly sworn, doth solemnly aver that "out in San Francisco they are laughing at one of the amateur directors of the company of merchants that has resolved to build a competing railway into the San Joaquin valley. The story is that at a meeting of the board to discuss the question of buying material, one director inquired, 'How much will fish plates cost?' Whereupon he was rebuked by a brother director for irrelevancy, because the time had not come to discuss 'the cost of dining car equipment!'" The railway journals published east of the Rockies have pooh-poohed the Valley Road right along, and have pretended to consider it a good joke.

—The $6,000,000 dredging contract between the Seattle South Canal and the Lake Washington Waterway Company and the Bowers Dredging Company, signed last week, is the largest dredging contract ever awarded to one firm in this country. The contract calls for the excavation of 35,000,000 cubic yards of earth, of which 9,000,000 yards are to be dredged from the waterways through the Seattle tide lands and 26,000,000 taken out of the three-mile canal connecting Lake Washington and Puget Sound. The company has five years in which to do the work, and expects to keep the large dredgers busy on it for most of that time. The earth excavated will fill in 2000 acres of tide flats.

—It is expected at the Cascade locks on the Columbia river, Oregon, that boats will pass through by Jan. 1, '96. For many years work on these locks has been dragged along and an immense amount of money has been expended by the engineers who were put in charge by the department. More has been accomplished during the past year than in any similar time before. The freight on wool from Pendleton to the Atlantic coast is now $1.65 per 100. From The Dalles it is 95 cents to the same points. The wool which goes to Boston from The Dalles goes through Pendleton, so that in the same train may be two cars of wool, one from The Dalles at 95 cents per 100, and one from Pendleton at $1.65, and yet The Dalles is more than 100 miles west of Pendleton.

—It is reported on the Sound that the Western Union is making arrangements to take possession of the old abandoned telegraph line now extending through British Columbia and Alaska, started thirty years ago to run to Europe via Behring straits and Siberia. Thirty years ago, before the Atlantic cable was laid, this line was constructed as part of a great world-circling line, which was to pass through Alaska, cross the narrow Behring straits, span the wilderness of Siberia, and connect Europe with America. The success of the cable spoiled this plan, and the line into the Cariboo country was abandoned many years ago. Now it is proposed to repair the old line and extend it north to Forty-mile creek on the Yukon and run branch lines to Sitka and Juneau, thus putting Alaska in touch with the great world from which it is now isolated. Nothing now remains of the several hundreds of miles of line stretched in British Columbia and Alaska but the rotted stumps of poles. The Indians long since took the wires and used them for making salmon nets.

Scientific Progress.

The Greatest of Modern Problems.

The problem of mankind—the economical production of energy—has been attacked on all sides by some of our most eminent scientists. It is openly confessed, says *Machinery*, that some other method than the mere combustion of fuel is necessary in order to obtain a greater percentage of its stored energy. Osmose—hitherto a superficially treated subject—is a rich field for the investigator. The pressure set up by a body when dissolving in a liquid, or a solution when mixing with water, may assume an enormous value. Common sea water acts with a pressure of 300 pounds per square inch in its tendency to mix with pure water. It is the substance in solution that causes this pressure, and it is true for all dissolved substances. The resolution of the theory of the primary cell to such a basis places us on a more substantial footing than ever before. Dr. Ostwald shows the parallel relationship existing between osmotic and electrical pressure. In other words, to obtain great E. M. F. from a cell, we must select two materials as elements with the greatest difference of osmotic pressures.

Now, Dr. Ostwald says that "the zinc and copper of the Daniell cell are two such sources of current of different potential, and the difference of their electrical pressure is based on the difference of osmotic pressure with which the zinc ions and copper ions are respectively endowed." A factor that will affect these conditions is the electrolyte. An electrolyte must be chosen whose reactive effect when charged with zinc ions will be least, while for the other electrode it will be greatest. By this means we are best prepared to make the most efficient combination with the elements at our command. In this introduction to the subject of consumption the inefficiency of a steam plant, the loss of ninety per cent of the energy of the fuel is due to the difference in temperature between the fire and boiler. Upon presenting this fact to our recollection, Dr. Ostwald points out a method for obtaining the chemical energy of the coal without heat. He shows that the application of an acid to the zinc in a zinc and platinum cell is not productive of the greatest E. M. F. The greatest electrical effort is produced by the acid being applied to the passive electrode. From this principle he contemplates the possibility of oxidizing coal—not by the oxygen in direct contact with the coal, but by the interposition of an unconsumable electrolyte. By this unexpected means the entire chemical energy of coal may be utilized, and in a manner so subtile and refined that no visible sign will appear of such an intense action.

Dimensions of the Universe.

While it is interesting to know the distance of some of the stars in miles, when stated in that way the numbers are so large that they convey very indistinct conceptions to the mind. For this reason it is customary to estimate star distances in "light years." A light year is the distance that light moving at the rate of 186,300 miles per second travels in one year. This amounts in round numbers to 5,880,000,000,000 miles. The distance of Alpha Centauri is 4.35 light years; that of Sirius, the Dog Star, is almost exactly twice as great, or 8.6 light years; that is, light requires 8.9 years to come to us from Sirius. And these are among the very nearest of the stars. Some, whose parallaxes have been rather estimated than measured, appear to be situated at a distance which light could not traverse in less than one or two centuries. The great star Arcturus, for instance, has, according to Dr. Elkin, a parallax of only eighteen one-thousands of a second. Its distance must, in that case, be about 181 light years, or more than a thousand million million miles. And if its distance is so great, then since light varies inversely as the square of the distance from its source, it can be shown that Arcturus must actually give forth 5000 or 6000 times as much light as the sun yields. Yet Arcturus is evidently much nearer than the vast majority of the stars are. Not one in a million is known to have a parallax large enough even to be intelligently guessed at. There may be stars whose light requires thousands instead of hundreds of years to cross the space separating them from us.

We thus see that only a few points on the nearer shores of the starry universe lie within reach of our measurements; here and there a jutting headland, while behind stretches the vast expanse over which the hundreds of millions of stars known to exist are scattered.

Origin of Light.

Prof. Dewar says that oxygen is highly phosphorescent; that under certain conditions oxygen will give off a steady light. This is a suggestion as to the origin and nature of light. The proportion of oxygen increases nearer the earth's surface and so does the intensity of light. As we ascend in the atmosphere, light and the proportion of oxygen to other gases decrease in nearly the same ratio. The force which radiates from the sun in straight lines comes in contact with the oxygen of our atmosphere, and it is argued this combined action ignites the carbon gases, producing light. This subject is not yet fully understood, but investigators are pushing their work, and it may yet be demonstrated that light originates in our atmosphere and does not come from the sun; that force comes from the sun, and that force wakes light by burning the gases within our atmosphere.

THE Kiel ship canal opened last week, and is about 61 miles long, 20 feet deep at dead low water and 229 feet wide. In numerous places the canal widens out to 428 feet to allow the largest vessels to pass each other. Work will be continued until vessels of any depth can pass at low water. The embankment is stone lined to a depth of six feet below the water. The locks at the North Sea end of the canal are the largest in the world with the exception of that at Bremerhaven. While no high hills interfered with the work, considerable difficulty was experienced in leading the railroad across the canal. Two of the bridges span the canal at a height of 137 feet above the water, besides which there are six opening bridges and sixteen ferries. The canal cost $39,000,000.

IN an article in the *Century Magazine*, Mr. Maxim says that, before selecting his motive power for his flying machine, he went carefully into the subject of weights of all kinds of motors. He found that the weights per indicated horse power were: Hot air engine, 200 pounds; oil engine, 75 pounds; electric motors, fed by secondary batteries, 130 pounds; Otto system, 50 pounds; marine engines, with condenser pump and everything complete, from 25 to 50 pounds per horse power. He uses a steam engine with boiler, gas generator, pump and 200 pounds of water, which weighs only 5.6 pounds to the indicated horse power.

NOW THAT Chicago's $25,000,000 drainage canal approaches completion, a commission makes the curious statement that the shallowing of the lakes occasioned by the diverted flow will diminish the annual earnings of the lake fleet over $1,700,000.

THE American Association for the Advancement of Science will hold its next session in Springfield, Mass., beginning August 28th and extending to September 7th.

IN the fiords on the Norway coast the clearness of the water is wonderful. Objects the size of a half dollar may be seen at a depth of twenty-five fathoms.

Mechanical Progress.

Water in Steam Pipes.

Prof. Thurston says: I know a case where the steam pipe was not sufficiently drained, and the water collected in the pipe and was carried over into the cylinder of the engine, wrecking it. Large stresses must be produced, and it would be interesting to observe how large these stresses are. No one has yet found a way of ascertaining them accurately. The fact that such accidents do occur, unquestionably due to the impact produced by the rapid condensation of steam on the surface of a pool of cold water, shows that these stresses must be enormously great. What may happen if a rapidly moving, heavy mass of solid water, in full career, strikes an obstruction we all know; but the hammering of steam in pipes produces a local strain probably quite as severe, perhaps even more serious.

This second kind of strain is known to be enormously great, but how much we do not know. He had occasion once to examine a quantity of pipe taken out of a heating system then in operation, but now extinct. He was informed that the pipes were defective, and was asked to examine them for the purpose of obtaining a report to secure from the makers a reduction of their cost and possibly damages. Many of the pipes were split through good welds and had welds, through solid iron even, and the only report he could make was that they were injured by water hammer. A quantity of the pipe was taken to the mill, where it was made, and the pressures they would stand were measured, split and weakened as they were. In order to obtain a fair idea of the actual pressures that the pipes would sustain, a rubber packing was arranged on the inside of each pipe, a strip covering each crack from end to end, drilling a few holes along the crack, so that the strength of the pipe should not be affected, and to insure that sealing these joints should not affect the strength of the pipe. The bolts simply hold that packing up against the crack on the inside, so as to seal it by the slight pressure of a line of small bolts which were put simply to hold the packing in place. Pipes arranged in this way, and tested in the hydraulic apparatus of the mill, carried all the way from 300 to 1000 pounds pressure to the square inch, injured as they were. The conclusion was obvious that the water hammer to which they had been subjected was enormously in excess of these figures, representing the strength of the pipe after the crack had been made.

These facts are more impressive than any possible examination, without actual measurement of these quantities, and reveal the intensities of the strains that occur, and the risks of danger which occur from allowing water to stand anywhere in a pipe. After water had once collected in a pipe, especially in steam pipes leading to engines of larger size, there is no way of removing this danger except by simply shutting the steam off at once, if it is moving in the pipe, or keeping the throttle shut, if it is not moving; then let the steam down and drain the pipe completely before steam is again put on.

Horseless Road Carriages.

For several years inventors and manufacturers have been trying to devise vehicles for common highways which might be propelled by steam, gas, compressed air or electricity for several hours without interruption. There is a growing demand for such carriages, and in time it will be met in a satisfactory manner. In a competitive trial held in France last year, there were twenty-six entries. Tests of speed were made on roads running out of Paris in various directions, and the honors were divided between steam and gasoline engines as propelling agents. However, it should be added that there was only one carriage relying on electricity derived from a storage battery in that contest. So great was the interest developed that a fresh competition was soon arranged for this year; it was held last week. A race in which fifteen carriages took part, and extending over the common highway from Paris to Bordeaux and return, afforded a more thorough, though by no means conclusive, test of the various systems. The distance traveled was 730 miles altogether. The best time both ways was made by a carriage driven by a "petroleum motor," and making an average speed of fifteen miles for forty-nine hours. The next three carriages to arrive were also propelled by the same means. Definite information regarding the mechanism used this year is not at hand, but the "petroleum motors" last year were really gasoline engines, arranged either in front of the dashboard or under the rear seat. The smell of the escaping vapor was unpleasant, and the carriage had a perceptible vibration while stopping on the road, owing to the action of the flywheel. Efficient as the storage battery is in propelling boats, its structure does not at present seem to be proof against the jar of highway travel. However, it is reasonable to believe that it will be perfected in this respect ere long, and it should then surpass all rivals.

Mechanical Notes.

If your pump fails to work look and see if there is any water in the well. If you have a driven well put it up and ascertain if the strainer is free and in good order.

If a flange union leaks steam, do not attempt to tighten the bolts while the pressure is on them. You may twist one of them off, and this may cause the others to fail.

If you have a flange union to pack, which is exposed to the action of oil, it is well to use some kind of packing that the oil will not dissolve, for it frequently happens that the cost of the packing itself is insignificant compared with the cost of labor required to put the packing in place. Put a small piece of the packing to be used in a cup of the oil, and let it stay there for a week, and if the oil has not affected it during that time it shows that it will resist the action of the oil when in use.

Keep water in your ash pit and it will protect your grate from the heat that might be generated by the falling fire.

The evaporative power of wood is, by weight, pound for pound with coal, about four-tenths of the latter; in other words, wood will do less than half the work that coal does.

When your smokestack gets rust-eaten take it down, or the first windstorm that visits your mill will level it, and in doing so it may do damage amounting to more than the cost of a new stack. It might fall on your employes or your engine.

When fitting up a steam plant provision should always be made for more than one boiler feeder. If only one is furnished, and some trivial accident disables that one, the cost entailed by even a short shutdown will more than cover the cost of a reserve pump or injector.

It is a good idea to be as economical as possible in the use of oil, but it does not pay to attempt to run an engine with an insufficient quantity of cylinder oil, for not only will the cylinder be ruined, but you will use extra oil enough to much more than pay for all the cylinder oil needed.

BORING steam engine cylinders while heated by the steam at full boiler pressure is reported. Measurements indicate that alterations take place in the shape of the cylinders under two extremes of temperature; and cylinders bored while cold are not perfectly true when under steam.

THE Cleveland, O., Rolling Mills Co., ship molten metal by rail from their central blast furnaces to their Newburg mills, five miles away, over the Erie road.

Electrical Progress.

The Possibilities of Electrical Pumping Machinery.*

By Chas. A. Hague.

The pumping of water by means of the power derived from the electric current has, as many are aware, already been accomplished upon a limited scale.

The convenience and controllability of electrical power, together with its simplicity of application to the work of pumping, commends it very strongly for use in isolated places, such as high service systems in public water supply, wherein a comparatively small percentage of the total water supplied by the initial plant is needed for dwellings situated upon levels too high to be accommodated by the general pressure; and the question, of course, arises whether we shall put the entire system of the city under the highest pressure required to force a supply to these higher levels, thereby placing a large portion of the mains and fixtures under an unnecessary strain, while operating under wasteful conditions of pumping power; or whether we shall isolate the higher levels and handle the smaller percentage of water by itself.

The application of electrical energy to the pumping of the main supply of a city of considerable size, although presenting many attractive features as far as the actual operation of the pumps is concerned, is not yet within the possibilities on account of the absence of inexpensive methods for producing the necessary current; so that, apparently, in pumping large quantities for some time to come, the compound, the triple and the quadruple steam pumping engines will hold their sway. To-day it is beginning to offset very forcibly the proposition that it does not pay, in the present state of perfection of the steam engine, to go very far out of the way of regular commerce to get the cheap power afforded by a falling stream.

To bring the problem of high-service pumping down to figures and familiar terms, supposing that a city's total supply is 10,000,000 gallons per day, and only 1,000,000 gallons are needed for a district which would make it necessary to deliver its supply under a pressure of 125 pounds per square inch if delivered from the main pumping station, while the remaining 9,000,000 only needed a pressure of 75 pounds for distribution. Then the difference in power would be as follows: The entire 10,000,000 gallons under the 125 pounds pressure represents 500 H. P., while the 9,000,000 gallons under 75 pounds pressure represents only 270 H. P., and the 1,000,000 gallons under the high-service pressure of 125 pounds represents only 20 H. P. The economy of power then would be 500−(270+20) =210 H. P. saved by dividing the service.

How convenient it would be to generate an electric current at the main pumping station, with the boiler plant used for pumping the main water supply, then run the wires up to a point adapted to the high-service pumpage and operate an electrically driven pump. Of course, a high-service steam pumping plant could be installed at the proper point, but that would mean expensive attendance, hauling of coal, ashes and supplies, and last, although by no means least, large quantities of smoke and dust dispensed broadcast over what is generally a residence district. There are cities wherein pumping plants are supplied with anthracite coal at double the cost of bituminous coal, to quiet the complaints of dwellers and the owners of lawns and trees.

Glance for a moment at the saving in fuel shown by dividing the service as set forth above. The case supposed is extreme, but extremes illustrate forcibly, and there are probably cases in actual practice the full equal of the one supposed. Allowing that an economic duty of 1,000,000,000 gallons is obtained at the pumping station, or, say, two pounds of coal per H. P. hour, then the 210 H. P. saved represents $5475 per annum, which would pay five per cent interest upon $109,500.

Even if it should not be desirable to install an electric generating plant at the main pumping station, power could often be obtained from street railways, or lighting plants already in existence in many cities. When we consider the inconvenience and cost of sometimes providing mains for different districts, simply to convey the water supply from a central high-service pumping station, the possibility of a small electrical station for each district begins to hint at the economy in first cost and maintenance of such an electrical system.

The method of switching on and off the electric current by means of the water-level or pressure is one of the details that will occur to the hydro-electrical engineer. In using the term hydro-electrical engineer, I simply follow the tendency to specialize which has taken strong hold upon modern science and practice. At the start the hydraulic engineer thought that there was nothing to do but harness up the electric dynamo and motor to a pump, and the task was accomplished of pumping by electricity. The electric engineer imagined that there was nothing to do but harness up a pump to his motor, and behold! the result was obtained. But after a few attempts it was discovered that the pump handling such a stubborn and inelastic element as water was subject to inertia, shock, and variable power within short limits, quite at variance with the steady, uniform operation desirable for the best electrical results. The pump man turned his attention to securing a steadier flow of water, while the electrical man was, apparently, inclined to adopt the convenient but wasteful methods involved in the process of wasting power instead of controlling it. Hence the hydro-electric engineer, whose office is to reconcile the extremes of the case into the most benefit to all concerned, precisely in effect as the modern steam pumping engine designer has evolved a machine which, operated by a highly elastic fluid at one end, smoothly delivers an obstinate unyielding fluid at the other.

If the steam pumping engine taking steam from the boiler at a pressure of 150 pounds and sending this steam to the condenser at a pressure eight pounds below the atmosphere, can deliver, without shock and with a fairly close approach to theoretical economy, a steady stream of water, there is every reason to believe that the hydro-electrical engineer will eventually be able to bring the items of short-circuiting, resistances, amperes and volts into a reasonably close approximation to the results demanded.

* Abstract of a paper read before the Atlanta meeting of the American Water Works Association, May 28-30, 1895.

Figures on Mine Working.

In answer to two Plumas county inquiries from mining men, San Francisco firms sent the following figures:

We estimate for you on a plant of sufficient capacity for 200-horse power, delivered as follows:

Two 100-K. W. 3000-volt alternating current three-phase generators, with pulleys and sliding rails; speed, 900 revolutions per minute.

Two 4½-K. W. direct current exciters.

Two panel switch-boards, containing standard regulating and operating instruments.

All f. o. b. cars, Oroville, Cal., and including the cost of erection after the apparatus is delivered from Oroville to Quincy, $5850.

In the matter of wire would say that the size of the wire, consequently the cost, varies with the amount of power to be transmitted and the distance of transmission. Assuming, however, the size of a wire necessary to transmit 200-horse power five miles, which would be of such a size that you could transmit any intermediate distance a branch off from it as you desired, the cost per mile, including wire, pins, insulators and cost of erection, would be $475. This would not include poles, which we presume you could get locally.

Of course, these estimates do not include any step-down transformers or motors. The price of these will vary with the sizes, and little of value could be estimated on these until you had an idea of what size units you would wish to have them operate in. The motors would in all cases be owned by the users of the power. Transformers would be presumably your property and would cost in the neighborhood of $3000, depending on the sizes and kinds.

Two Great Enterprises.

This week the two greatest electrical achievements of the time have been successfully inaugurated—the transmission of electric power from Folsom to the State capital, 22½ miles, and from Niagara Falls to Buffalo, New York. The California enterprise essays the transmission of electric power over a greater distance than any heretofore attempted. The Niagara enterprise, by reason of its great cost, and in the face of $1.50 coal, attracts equal interest. To both projects the scientific and commercial world gives equal attention. San Francisco capital is behind the Folsom-Sacramento project: New York City money has been the mainspring in the Niagara-Buffalo proposition.

A special "Niagara Power Number" of *Cassier's Magazine*, speaking of the station there, says:

The great power installation at Niagara Falls, by which, for the present, about 50,000 horse power is to be utilized, comprises a surface canal, 250 feet in width at its mouth, on the margin of the Niagara river, a mile and a quarter above the falls, extending inwardly 1700 feet, with an average depth of about twelve feet, serving water sufficient for the development of about 100,000 horse power. The solid masonry walls of this canal are pierced at intervals with ten inlets, guarded by gates which permit the delivery of water to the wheel pit in the power-house at the side of the canal. This wheel pit is 178 feet in depth, and is connected by a lateral tunnel with the main tunnel, serving the purpose of a tailrace, 7000 feet in length, with an average hydraulic slope of six feet in 1000, the tunnel having a maximum height of 21 feet and width of 18 feet 10 inches, its net section being 386 square feet. Its slope is such that a chip, thrown into water at the wheel pit, will pass out of the portal in three and one-half minutes, showing the water to have a velocity of 26½ feet per second, or a little less than 20 miles an hour when running at its maximum capacity. Over 1000 men were engaged continuously for more than three years in the construction of this tunnel, which called for the removal of more than 300,000 tons of rock, and the use of more than 16,000,000 bricks for lining. The construction of the canal, and especially of the wheel pit, 178 feet in length, with its surmounting power-house, were works of corresponding difficulty and importance.

Wheels, calculated to yield 5000 horse power each, occupy a position in the wheel pit, 140 feet below the surface, to which water is conducted by a tube, or penstock, leading from the service canal, and discharging between the twin wheel, from which the water falls away into the side tunnel, conducting it to the main tunnel and thus to the lower river. The power, of course, is developed through the drop in the wheel pit, the tunnel serving the purpose only of a tailrace. Three of these wheels have been built, and are now in place. They are about five feet in diameter. The penstock, seven and one-half feet in diameter, is made of steel, and the constant pressure of its column of water, discharging between the twin turbine wheels, serves to support the entire weight of all the revolving parts, namely, the weight of the wheels, the vertical shaft and the revolving parts of the electric generator driven by the wheel.

The mechanical problem to be solved in this case, viz.: How to get 5000 horse power from the point of development at the wheels to the surface, 140 feet above? was considered to be much less difficult than that presented in the case of an Atlantic steamer, where the motive power of the 5000-horse power engine is delivered by a horizontal shaft to the screw at the stern of the vessel, more than 140 feet away, the water wheels at Niagara being our engine, the generator at the surface, our screw and the connecting shaft (adopted in preference to belting or ropes), 140 feet in length, being vertical instead of horizontal. This shaft is of steel, three-fourths of an inch thick, carefully rolled into tube thirty-eight inches in diameter, without any riveted vertical seams; but at several intervals, where journals are needed to steady this vertical shaft on fixed collar bearings, it is solid, and at those points measures eleven inches in diameter.

Each of the water wheels drives a mammoth electric generator of 5000 horse power, and of a form devised by Prof. George Forbes of Loudon, resembling a mushroom or umbrella, in which the stalk or handle is the shaft of the turbine, and the cap is the revolving part of the generator, serving the purpose also of a fly wheel for the turbine. This special advantage resulted from Prof. Forbes' happy idea of a dynamo in which the field magnets should revolve instead of the armature.

A Powerful Projectile.

At Indian Head proving grounds on the Potomac, the Ordance Bureau of the Navy Department is making the first complete test of the most powerful projectile yet contrived for modern naval warfare—the Wheeler-Sterling semi-armor piercing projectile; each of these shells weighs 1000 pounds. The projectiles are thirteen inches in diameter, two feet long, and have a conical head of chrome steel. They are supposed to pierce the toughest nickeled steel armor to a depth of seven inches and then explode. There is no end to the havoc they will cause. One of them successfully shot is supposed to tear the biggest battle ship to pieces. The projectiles carry sixty pounds of highly explosive powder in their heads. The Ordnance Bureau has ordered 400 of these projectiles and two selected at random from each hundred are put to the test. In order to make the shells conform to the requirements of the navy these eight shells must perform successfully the work claimed for them. A charge of 650 pounds of powder is required for each shot. The gun from which they are fired is thirteen inches in inside diameter — the largest bore used on modern battle ships. The test arranged is to be conducted under all the conditions as nearly as possible as they would exist in naval engagements. A ship's side in facsimile of the battle ship Iowa has been built at the navy yard at Norfolk and sheathed with the armor plate to be used on this great battle ship. This has been brought to Indian Head and the eight 1000-pound projectiles will be fired into it from a distance of 2000 yards.

Millions of acres of land are to be added to the great areas of the West. The last Congress enacted a law providing that the general government shall donate to each State in which there are arid lands one million acres of such lands, on condition that the reclamation is done by the States. Already Idaho and Wyoming have complied with all the formalities of the law, and have taken steps towards securing the million acres of land within their borders. California has not yet acted in this important matter.

The iron foundry at Birmingham, England, in which James Watt worked out his idea of the steam engine, has been closed after an existence of 133 years. It at one time employed 4000 men, but only one-tenth as many were on the roll when the doors were closed.

Mining Summary.

CALIFORNIA.

Mariposa.

AROUND COULTERVILLE.—*Gazette:* Water is drying up rapidly but still for many miles around Coulterville prospecting parties and pocket miners are at work. Though the country is a difficult one for a stranger to find his way in, those who know their way about can usually locate a good spring of cold water within a mile or two of any given point.

AT REDBANK.—At Redbank, eight miles up the river from the Horsesboe, large operations are opening up. Ten miners are at work driving two tunnels, and the same number of men are employed above ground. The Redbank owners propose to spend between $300,000 and $400,000 on the development of their property, and are entirely satisfied with their prospects.

Nevada.

THE ROSE HILL.—*Tidings:* The Rose Hill mine's new gasoline engine only costs $3.20 per day for crushing 12 tons of ore. Since starting up they have crushed 150 tons of ore, which gave good results. The cost of the mill screens, plates, buildings, foundations, machinery, including freight, has been less than $2200. Thus, at a profit of only $6 per ton, less than 400 tons will pay for the entire establishment.

SOLD AT SHERIFF'S SALE.—*Transcript:* The sheriff has sold the real property of the Gold Flat Mining Co. to satisfy a judgment for $475.11 in favor of J. Kitts.

THE BELLEFOUNTAIN.—An assay has been made of some of the rock taken out of the Bellefountain mine at Willow Valley, which gave a result of $338.50 per ton.

CANADA HILL.—*Transcript:* At the Mayflower mine, on Canada Hill, the buildings for the new hoisting works and for the new twenty-stamp mill which the company intend putting up are being built. It is expected that the new works will be ready by Sept. 1.

Placer.

THE PIONEER MINE.—The Colfax *Sentinel* reports the probable sale of the Pioneer mine to an Eastern company, recently capitalized at $1,000,000, one-fourth of which was subscribed.

Plumas.

GREEN MOUNTAIN MINE.—*National-Bulletin:* Work at the Green Mountain mine is progressing very favorably. About 35 men are employed in and about the property. Taylor D. McLeod is organizing a very effective force of men. Four headings are now being run and good progress made.

THE TABER DRIFT MINE.—It is expected that Horace Taber will soon reach gravel in his mine in Gibsonville ridge. If he does says the *National-Bulletin*, it will cause the old mining town to boom as in early days, when both people and dollars were plentiful. Not only would the striking of gravel in this mine result in its development on a large scale, but it would cause capital to embark in other big drift-mining enterprises. The Thistle Shaft is working a large force of men and taking out lots of gold. The Taber mine is on the same channel and next above the Thistle Shaft property. Its development into an extensive and rich mine therefore appears to be among the certainties.

San Bernardino.

THE DESERT BONANZA.—*Record:* Boone and Souter returned Thursday from a five weeks' trip to the desert. They visited the McHaney properties, seventy-five miles northeast of Banning, and from what they say the reports regarding these prospects have not been misrepresented in the least. The McHaneys are stockmen and almost stumbled on their properties, they having been passed over for years by experienced prospectors. There are four claims in the group and each shows up gold ore in immense quantities, some of it having the appearance of having been shot in. On one of the claims a tunnel has been run in thirty feet on the ledge. At this point the ledge takes a sudden dip and runs nearly perpendicular. The ledge varies in width from thirty inches to six feet, and through it runs a ten-inch pay streak. From this rich ore has been taken. A five-stamp mill is now being put up six miles from the mine by the Messrs. McHaney, and a number of teams are steadily employed hauling ore. Much of the ore that will be worked has come from the croppings along the ledge, and it is very rich. The McHaneys have already received $10,000 from ore that has been worked at custom mills. Messrs. Boone and Souter say they believe this section of country is destined to become a prominent mining camp, as there is no doubt that fine ledges and immense deposits of ore exist there. The one drawback is water, but wells are now being sunk and it is believed that with depth water will be obtained.

Shasta.

MINES AND CAPITALISTS.—*Democrat:* Mines near Redding are working actively and the times promise activity in Shasta county mines. The new process of reducing rebellious ores of the Eureka Tellurium Mining Company, at their mine on Salt creek, is successful. The company is now running its works every day. This process will revolutionize mining in Shasta county. There are a number of rich ledges that are extensive, but heretofore considered of little value because there was no process in the county by which the gold could be separated from the gangue. This difficulty is now overcome, and these mines are now as valuable as free-milling propositions.

Lane & Hayward have a bond on the Brunswick mine, in the French Gulch district, for $80,000. This property has lain idle for nearly twenty years, but proper development opens a large body of rich ore, and a mill test showed $35 ore and plenty of it. There are a number of other mines in the neighborhood that, with proper development and judicious management, would show equally favorable results. The *Democrat* believes this is the first Shasta county mine purchased by a California company. All of the desirable mines are falling into the hands of either Eastern or European syndicates.

Not long ago a representative of one of the largest California mining companies remarked to the writer that it was a shame that the people of Shasta county allowed a foreign company to get hold of such a fine piece of property as Iron Mountain. The *Democrat* deems it is a shame and a disgrace not only to the people of Shasta county but to the mining capitalists of San Francisco and other mining counties of the State. The Iron Mountain property has been known in the San Francisco market for over ten years, and local capitalists paid no attention to it and asserted with brazen indifference that it was a great big base property without merit. But when thorough mining men from London once visited the mine they saw that it was not only a good investment at $300,000, but that it was one of the largest and most extensive mining properties in the world and they did not hesitate to pay over a quarter of a million for it. To-day Iron Mountain cannot be bought for three million.

The *Democrat* continues: "Capitalists of San Francisco and other localities generally set up a howl about foreigners gobbling up all the best properties in the State. Such is a fact. The Uncle Sam is owned by a London syndicate: the Quartz Hill is owned by a Polish syndicate; the Iron Mountain is owned by a London syndicate; the Washington and Gladstone are owned by Eastern syndicates, and all the desirable mines on Mule mountain and Salt creek are owned by Eastern capitalists. All the valuable gravel mines in northwestern Shasta and in Trinity county are being gobbled up by French companies. Whose fault is it? Our own capitalists. California capitalists will have to learn that mines in Shasta county have a value, and if they wish to own the mines they will have to pay something near what the mines are worth. If they don't do this, there are hundreds of men of unlimited capital in the Eastern States and Europe who will be glad to pay fair prices for Shasta county mines."

THE NEW BRUNSWICK.—*Free Press:* The New Brunswick mine, located near the old Tom Green mine, near French Gulch, has been bonded by Captain C. N. Tozier, C. D. Lane and D. B. Hunt for the sum of $40,000. They will develop the property. Cochran & Rossi, the owners, will be allowed to work out their present level, while the bond holders will run lower levels to determine the depth of the ledge. The owners have made considerable money and will yet have a chance to make $1400 or $1500 out of their surface workings.

BONDED THE PROPERTY.—Thomas James of Virginia City and Joseph and Edwin Carpenter of Sacramento have bonded the mining property of Mr. Bughee, near Iron mountain, including the Little Nellie mine. Joseph Carpenter departed for San Francisco Tuesday to make arrangements for the erection of a chlorination plant on the Little Nellie.

Sierra.

Messenger: C. J. York partially cleaned up last Saturday, after a run of twenty-three days with an arrastra, on ore from his mine situated in Sing canyon, less than a mile from Downieville. The output was $625 from forty-six tons of rock; and as he estimates $75 left in the arrastra, the quartz pays over $15 per ton. This ledge was discovered about two months ago, and bids fair to become a valuable property. A drift fifty feet in length has been run on the ledge, which averages four and one-half feet wide. Cuts have been run along the line of the ledge for a distance of 150 feet, and wherever uncovered, the quartz prospects well. This body of ore lies between walls of serpentine and porphyry. If some of the mine owners in this vicinity, who have been "holding on" to valuable ledges for years without endeavoring to develop the same, would emulate Mr. York in his enterprising efforts to open up his property, this part of the county would enter upon a new era of prosperity. Mines would be sold, mills erected, and capital would seek investment in our gold fields.

Siskiyou.

AROUND YREKA.—*Journal:* The gold realized from the crushing of Williams & Wildman's quartz at Lamb's mill in Yreka, hauled from Greenhorn, brought $18.21 per ounce. Thirty-four tons crushed averaged $33 to the ton. A large quantity of tailings and sulphurets are saved, to be worked later, when concentrators are procured to save the fine gold.

Work is progressing at the Espey Hunter & Co. mines. The pumping machinery is not yet ready. The flume from the top of the hill above the electric light works at Shasta river is completed to the claims, but work cannot be commenced until it is supplied with water from the river by the pumping machinery.

NEVADA.

STOREY COUNTY.

THE BRUNSWICK LODE.—The Brunswick lode is traceable on the surface for a distance of 14,000 to 15,000 feet, the surface indications comparing favorably with those that were found in the croppings of the Comstock lode. At several points the Occidental, St. John and Monte Cristo mines have yielded well. On account of water no mining at depth has been done except at the Occidental, and owing to the amount of water encountered at the Monte Cristo vertical explorations have not been extended below 150 feet.

On the Comstock lode the majority of the bonanzas were encountered between the 1300 level and the surface, and it is at the depth of 1300 feet that the great Comstock tunnel taps the Brunswick vein.

On the St. John mine the vertical depth of the Sutro tunnel below the surface is 1344 feet; it cuts the vein at a depth of 1900 feet (on the slope of 45 degrees) below the croppings. In the nearly 2000 feet of vein lying above the level of the tunnel there is valuable ground to prospect by upraises from the tunnel south along the foot wall.

That paying ore does not appear in the vein at a certain point on the level is no indication that there is not paying ore some place above. There is a beginning and an end—a top and bottom—to all things, and under and above the best bonanzas ever discovered is found to be barren ground. The lode where passed through by the tunnel was 113 feet wide; where cut through by the crosscut made from the Zadig tunnel southerly toward the Occidental tunnel is 130 feet in width.

The vein is composed of the same materials as the Comstock—quartz, clay and porphyry—is well defined and carries the Comstock characteristic clay on the footwall.

ON THE COMSTOCK.—The Chollar mine last week extracted and sent to the Nevada mill 15 tons of ore, the average battery sample of which was $33.56 per ton, and shipped 152 pounds of bullion, the par value of which was $3579.74. They have started a south drift from the raise above west crosscut No. 2, 450 level, which is out 16 feet in quartz, assaying from $25 to $30 per ton.

In the Con. Cal. & Va., along the west wall of the eighth floor, continue to find some timbers of old workings, in which are fillings of ore, which it will pay to save. From the second floor up to the eighth floor of this level have extracted 86 tons of ore, the average assay value of which per minecar sample was $36.46 per ton. The Morgan mill will commence running again about the 5th of July.

ESMERALDA COUNTY.

In the Silver Star district a few of the leasers are taking out ore, but most of them are waiting to see what the new company intends to do. The owners of the Gem and Lone Pine are taking out rich ore and developing their mines. The Oneida and Juniper are yielding the usual amount of rich ore. They are making an upraise in the Bounce to get air, when the drift on the ledge will be run ahead to tap the ore body at the bottom of the west winze. These mines are all outside of the ones lately sold, and are all improving as work goes on. Work at Silver Peak is being pushed, and the mill will start next week.

OREGON.

JOSEPHINE COUNTY.

GENERAL NOTES.—Mining is the only business that brings in any money at Grants Pass. Prospectors are numerous. Several small strikes in pockets are reported.

The Griffin ledge, on summit of Siskiyou mountain, which crosses the State line into California at head of Althouse, is being developed by G. C. Weston.

Simmons & Co., at Waldo, are pushing work with their three giants night and day. Their race is over two miles long, very flat, and requires the whole of the east fork of Illinois river waters to wash with. This claim is free from boulders, being a surface shedding from the hill, and is a deposit of fine clay. Their bedrock is a boulder formation, caused by the washing of these hillsides of the Pacific ocean for ages past. This formation is packed so solid that it makes a fine bottom for a mine race and holds quicksilver to catch the fine gold, as all the gold in this mine is very fine.

BAKER COUNTY.

THE BAISLEY-ELKHORN.—The Baisley-Elkhorn mine was sold at auction last week in Baker City to R. S. Cates, agent for R. O. Deming of Kansas City, for $31,000. He gave the sheriff a draft for the amount and entered at once into possession of the property. Some $8000 in claims still stand against the mine for labor and materials.

WASHINGTON.

METHOW DISTRICT.

Messrs. Saheau and Kinney, who have been in the Methow mining district for several months, say a condition of affairs prevails in that district which the new mining laws will regulate to a considerable degree. Poor prospectors who happened in early in the season located twenty-five or thirty claims promiscuously, wherever there was even an indication of metal, and in that manner the greater portion of Okanogan county is located. No work has been done on most of them. The evil lies in the fact that new-comers are always steered up against these worthless claims with a view of making a sale and in that way the visitor gets a bad impression of the country and mines, and also from the fact that everything in sight is located and no development work done of any consequence. One man was mentioned in particular who had located over forty claims since spring and was at present cutting cordwood for the steamboat at $1 a day, trying to raise a grubstake. It is also asserted that mere prospects, with scarcely any development whatever, are held for such high figures that it is almost impossible to get capital to take chances on such a large sum on a prospect, and thus development is held back.

BRITISH COLUMBIA.

GOOD CLAIMS AND WILDCATS.—Frank J. Parker, of Walla Walla, has been inspecting the Trail creek mines. His view of the mines is that of all other experienced miners—that there are good properties there. Hundreds of claims have been recorded, in his opinion far too many.

"The whole country," he says, "is literally seamed with iron ore, and as this was the cropping on the War Eagle, Le Roi, Josie and other ore shipping mines, the general idea is that underneath every seam of iron ore is an equally valuable mine. But the owners in the great majority of cases fear to do any work whatever upon these iron seams and ask thousands of dollars for their interest without having performed more work than an old ben could scratch out in five minutes. Yet every such claim is supposed to be a mine, and there are twenty grafters after each one to unload upon some credulous man with more money than brains. Men owning such claims by the score are walking around with their hands uncalloused waiting for a victim. All the shipping mines so far are situated in one section, on Red mountain, except the North Star, which commenced shipping this week, and the owners are anxiously awaiting returns.

"The whole country is staked out, as the iron seams mean 'mineral in place,' and are so recorded. The mining laws are excellent, the only weak point being that they do not require the boundaries of claims to be properly defined. Many claims are recorded which have no place on the map, so I would advise all who think of investing to go very slow until they are assured the title is perfect. It was on this account I did not bond a prospect I thought likely to be good, for there is no great satisfaction after paying for a claim and spending a thousand dollars or so on it to find it belongs to some one else."

AT QUESNELLE FORKS.—The company in charge of J. B. Hobson, formerly of Placer county, is finishing the canal on which 550 men are at work, 300 Chinamen and 250 white men. The latter receive $2.50 a day and pay $1 a day board; the Chinese get $1.75 and board themselves. It is estimated that the canal will carry 5000 miners inches of water and will be finished by Sept. 1.

A BIG TUNNEL.—The War Eagle Company has ordered a 20-drill compressor, and as soon as the plant is on the ground the longest and largest tunnel ever driven in Kootenay will be started. It will be begun on Center Star creek, and will traverse nearly the whole length of the Iron Mask ground. Thirteen hundred feet will have to be driven before the War Eagle ore chute is struck. This will be the main working tunnel of the War Eagle mine. It will give a depth of 450 feet, and from that down the mine will have to be worked by sinking.

IDAHO.

THE FRISCO MINE.—Wallace *Miner:* There are about 100 men at work on the Frisco and seventy of these have been discharged, leaving thirty men, or thereabouts, at work. Of these only ten men are employed in the mines in addition to a few shovelers. The remainder are working on the surface getting ready for the new hoist and air compressor. All the work at present in progress in the mine is drifting on the lower level and raising from the same. They are grading and otherwise preparing for the large air compressor plant, which has been ordered, but is not expected here about two months yet. Manager McDonald states that it is very indefinite when they will resume full operations again.

THE POORMAN.—*Avalanche:* At the Poorman a new mill is being built.

THE TRADE DOLLAR.—A contract to extend the Caroline tunnel 100 feet has recently been awarded.

THE FLINT.—The Flint Company has resumed operation at their mines after an idleness of several years.

A DESERTED VILLAGE.—Coeur d'Alene *Miner:* Nothing could be more desolate or disconsolate than Mullan now appears. It is safe to say that three-fourths of the buildings are empty. Many of these buildings cost their owners thousands of dollars, and in the majority of cases twenty per cent could not be realized on the investments. The reason for this is well known to all residents of the Coeur d'Alenes. It is almost needless to say that the people of Mullan, the few who are left, are very weary of this condition. They know that their prettily located little town is surrounded by mines capable of supporting a large population in comfort, if permitted to operate.

MONTANA.

THE BENTON GROUP.—The Neihart *Herald* says that seventeen men are employed at the Benton group of mines in that county, and that some good ore is being taken out. The owners of this property have worked it steadily for more than four years, generally employing forty to fifty men. They have expended in that time about $240,000 in development work, which the mine has paid in shipments of its ore. The fact of its continuous run during the hard times is remarkable for a silver property, but the owners have not yet realized anything from their investment.

THE KATIE MINE.—The men at the Katie mine, Basin, have received their pay in full for the time which they were behind. Over $130,000 has been paid out, and all the miners are now paid up to May 1st. A contract has been let and the first consignment of machinery received to double the capacity of the mine.

A WILD KITTEN.—Phillipsburg *Mail:* The issue of the Tacoma *News* of the 21st ult. contains an immense advertisement descriptive of a mammoth gold mine said to be located twelve miles northeast from Phillipsburg, on the line of the Phillipsburg branch of the Northern Pacific. The vein is said to be 16 to 20 feet between walls traceable the full length of the property—4500 feet. The advertisement gives assurance that extensive buildings and machinery will be put on the ground very soon for handling 40 tons of ore each day at a gross profit of $12,000 a month. Continuing, the advertiser states that in order to mine and place on the dump several thousand tons of ore ready to be milled, a limited amount of stock will be sold at ten cents per share. The price is subject to advance without notice, as each week's work pay ore adds value to the mine and price of stock will advance accordingly. For particulars the reader is requested to address L. A. Loomis, 215 Washington building. The exist-

ence in Granite county of such a mine as the Gold Coin Co. describes will be news to its residents. It would seem that a property with such riches right here at home would be known among the mining men of this county, but we fail to find a single individual who ever heard tell of it before. It would appear that the Gold Coin Company ought to establish their identity at the home of their mine before a stampede from Tacoma to the rich discoveries takes place. Such mining enterprises as the above are the greatest drawback to the legitimate industry, and the *Mail* would advise the good people of Tacoma to thoroughly investigate the reliability of the company before making investments with them.

NEW COMPANIES.—The following are new Montana incorporations:

The Bell Group Consolidated Mining Company to work a property near Townsend.

British-American Mining Company, Butte and Trail Creek, B. C.; capital stock, $500,000; to carry on general mining and townsite business, West Kootenai mining district, B. C., to continue for forty years.

Oriental Gold Mining Company, Butte and Basin; $500,000.

High Ore Development Company, Basin; $250,000.

Sixteen to One Mining and Milling Company, Bozeman; $1,000,000.

Castle Mining Company, Great Falls, $200,000.

Montana Antimony Mining and Smelting Company, Thompson Falls; $200,000.

UTAH.

NEAR MILFORD.—*Herald:* The Montreal Mining and Smelting Company operating in the neighborhood of Milford will let a contract for 300 feet tunnel work. It is thought that the Montreal people have a second Annconda in the possession of their southern properties. The copper is running up as the development progresses, until now 38 per cent is a common assay.

GENERAL NOTES.—Captain De Lamar is pushing operations on the Golden Gate group, recently purchased by him, in the Camp Floyd district. A new steam hoist has just been completed.

The Ibex smelter, at Leamington, now in the hands of a receiver, was blown in last week, and the plant will be operated to pay off the claims against the company.

Two gold bars were sent in by the Mercur Company during the week. Their value was $15,518, making the production for the month over $50,000. The Mercur Company has added to its cyanide plant a converter by which the cyanides are reduced to bullion.

After an idleness of several weeks the Commercial mill at Bingham has resumed operations, the claims against the company having been settled and the attachments released.

During June the Ontario and Daly mines, operated by the same management, have produced 114,000 ounces of silver.

WYOMING.

A REPORTED DISCOVERY.—Gold is reported discovered twelve miles from Douglas. Over 100 claims are staked out to-day.

COLORADO.

DIFFERENT MILLS AND PROCESSES.—*Review:* The following is a fairly complete list of the different mills and processes in operation in Cripple Creek district.

Crawford mill, electro-cyanide process.

Gold & Globe mill, amalgamation and chlorination.

Brodie mill, cyanide.

Gold Geyser mill, Anaconda, amalgamation.

Hartzell mill, Anaconda, amalgamation.

Lawrence mill, Wilson Creek, chlorination.

Beaver Park mill, Beaver Park, amalgamation.

Colorado Springs mill, Beaver Park, amalgamation.

Denver mill, Beaver Park, amalgamation.

Summit mill, Beaver Park, amalgamation.

Gillette mill, chlorination.

United States Economic Reduction company, bromination.

Florence mill, cyanide.

TWO PROPERTIES CLOSED.—The West End mill and Black Wonder mine, a dual concern operated by the Black Wonder Gold and Silver Mining Company of Boston, have closed down. The properties are situated at Sherman, Hinsdale county, near Lake City, and Sherman now presents a spectacle not uncommon in the West—that of a thriving mining town which has been completely deserted.

The stated cause is that the mine could not produce enough ore to keep the mill running, but the most generally accepted theory is that the Boston syndicate backing both refused longer to advance money, over $100,000 having been sunk in the properties. H. Stearns, one of the Boston directors, was in Lake City last week, and it was after an examination by him that the order to close was given. The indebtedness of $13,000 is said to have been paid.

WHOLESALE THIEVERY.—Discovery of the thefts of rich ore from the Golden Fleece mine has led to the belief that ore worth millions of dollars has been stolen from the mines of Colorado in the last ten years by an organized hand. The robberies have not been committed by the miners, who are generally honest men. So far there is no clue to the leaders, but it is believed that with detective work and the spending of much money the thieves may be caught. The loss sustained by the Fleece is placed at $70,000, or more than the actual dividends of the mine. The Fleece has paid the June dividend, but ordered a suspension of all work on the mine until responsibility for the stealing is placed. At a meeting of miners at Lake City considerable feeling was developed over the statements of the directors that the employes were responsible for the loss. The union adopted resolutions deprecating the action of the company in branding as thieves former employes. The meeting adjourned until such time as Manager W. A. Aikers could be present, when efforts will be made by the conservative element to heal the breach that has been opened by the company. One dwelling was searched, on suspicion that the occupants were implicated. No evidence was found. It will be impossible for the victims to recover anything from the stolen ore, which is supposed to have been forwarded to an Eastern smelter for reduction. Among other mines that are said to have suffered from the smugglers are the Della S., Mollie Gibson and Argentum Juniata of Aspen, the Victor and Pike's Peak of Cripple Creek. The method of stealing is simple: From blocks of ore corners are knocked off and carried away in the pocket. Hereafter those mines will be handled more after the manner of the diamond mines. The leading mine owners have organized for protection, which may be obtained through the smelters and ore buyers, who can detect the stolen ores when offered for sale. The stolen ore has not been marketed in Colorado. This indicates that the thieves are possessed of money and are capable of getting their ores out of the camps by some underground road, so as to avoid the possibility of detection by the railroad detectives, who are constantly on the alert for such cases. The Victor mine has discovered that its richest ore was being stolen by some means that defied all attempts to trace. Returns on the surface did not agree with the reports from the underground works, and the investigation showed that lots of the rich ore was not coming to the surface on account of the company. Search failed to reveal the ore in the shafts and tunnels, and the inference was that it had been taken out in a surreptitious manner during the night, or at hours when darkness would allow the thieves to remove the ore in small lots without attracting attention. There was but one remedy for the evil, and that was adopted by the manager. Every employe of the Victor was discharged, and the new crew placed under surveillance.

AN INTERESTING EXPERIMENT.—Georgetown *Courier:* Prof. Richard Pearce of the Boston and Colorado smelting works, recounts the following interesting experiment at Argo. He took a crushed sample of rich ore from Cripple Creek, which carries 1100 ounces of gold per ton, and digested it in a very weak solution of sodium chloride and sulphate of iron, making the solution correspond as near as practicable to the waters found in nature. The ore was kept in a place having a temperature little less than boiling water for six weeks, when all the gold except one ounce per ton was found to have gone into solution. A few small crystals of pyrite was then placed in the bottle of solution and the gold began to immediately precipitate on them. It was noticeable, however, that the pyrite crystals which were not free from zinc, galena and other extraneous matter, received no gold precipitate. Those which had no such foreign associations were beautifully covered with fine gold crystals.

TWO NEW COMPANIES.—The Big Johnny Gold Mining Company and the Keystone Belt Mining Company have incorporated in Denver to operate in the Western pass near Leadville, both for 1,000,000 shares. The organizers are old prospectors and have spent several years exploring the country in and around the Western pass. Considerable development has been done on the Big Johnny property. The Keystone property will also be opened up and pushed to the contact.

THE FLORENCE CYANIDE WORKS.—The Metallic Extraction Company (the Moffat-Smith Cyanide Works) has shipped 750 ounces of gold, the result of a two-weeks' run on Cripple Creek low-grade ores. The works are running twenty-four hours a day every day in the week. Foundations are being constructed for two additional crushers. The owners of the plant are reported so well pleased that they will shortly begin work on another plant equally as large as the present one.

BUSY PROSPECTORS.—There are probably 1000 prospectors now in Green Mountain district, and new finds are daily being made.

A FLOODED GOLD MINE.—A Leadville dispatch says the Rex mine was drowned out last Monday and there is now over 250 feet of water in the shaft. All the workmen made their escape. The ore, believed to be very rich in gold, was just being entered when the mine was flooded. It is likely that a mammoth pumping plant will be put in and the shaft drained at once.

SILVER AT HAHN'S PEAK.— Steamboat Springs, Colo., reports considerable interest in the neighborhood of Hahn's Peak over the discovery of a blowout of silver-bearing rock, said to come from the blanket vein. The ore is said to run several hundred ounces of silver to the ton. There are already 400 or 500 men on the ground and hundreds of claims have been staked.

INDIAN TERRITORY.

The many sensational stories of a wild gold excitement in the territory are all untrue. The gold field at present consists of a large area of country covered with claim stakes and there are a few poor farmers washing sand in home-made sluices. There is probably gold in the sand underlying Boggy creek country, but it will take several assays to determine whether it is worth taking out. It will take experienced prospectors to determine where the sand is and lots of money to collect the gold from the sand. The country may develop a gold field in time, but at present there is nothing to get excited over.

Assays of several samples of sand taken out at various points show gold possibly in paying quantities, but if it is there in sufficient quantities money will be required to put in machinery and condensers. The only way to work the sand will be on tables like quartz tailings are worked. The stories of thousands of people being in the diggings are pure fabrications. But comparatively few men are there, and several so-called camps, and many of them are so poor that they barely exist. The stories of Oklahoma towns being depopulated and thousands rushing to the diggings have been originated by men interested in drawing outsiders with money into the territory. The Boggy creek country is a good one to stay away from, but experienced mining men with money may find something there to interest them.

NEW MEXICO.

GENERAL NOTES.—Silver City *Enterprise:* At the Van smelter copper matte is being produced at the rate of two tons per day. The company have an assurance of an abundant supply. Bell & Stephens are shipping eight tons of ore per day and seven tons of concentrates. The ore will run about two ounces per ton in gold and carries a good percentage of copper. The concentrates made from the tailings of the Bell & Stephens mill will run nearly as high as the raw ore which is shipped.

The Texas mine has been shut down temporarily, to adjust differences between owners.

The Ivanhoe smelter is compelled to suspend operations on account of scarcity of water. Every indication points to an early rainy season, a few showers have fallen already.

Galloway & Alexander shipped a four-ton sample of ore to the Davis mill at Gold Hill for reduction. The ore is said to have run $38 per ton in gold, on the plates, and the tailings to have assayed $17.00 per ton.

FOUND AGAIN.—The Adams Diggings have been found again, but this time they are located at the head of the Animas in Sierra county. The discoverer is said to have taken $10,000 in gold to Las Cruces. He then went crazy and died.

ARIZONA.

GLOBE ON THE VERGE OF A BOOM.—H. D. Underwood tells the Arizona *Silver Belt* that Globe is on the edge of a great mining boom. The big Buffalo mines under the management of Dr. E. H. Cook are being put in readiness and work with a large force of men will be shortly begun.

The Old Dominion in the hands of its new proprietors is also shaping itself for action.

In the belief of Mr. Underwood 700 men will be at work within the next sixty days.

The Bowie and Globe railroad has been completed as far as Fort Thomas and as soon as it has been definitely settled when work in the Globe mines will be resumed the railroad will be pushed.

GENERAL NOTES. — *Journal-Miner:* The Crowned King mill is running day and night. Fifty men are at work.

The Rapid Transit, near Crowned King, owned by Henkle & Mitchell, is being worked; fifteen miners employed. The ore samples $50 in gold and 50 ounces in silver.

There are fifty men placer mining within a distance of fifteen miles on the Upper Hassayampa, some working new ground, many handling ground that has been worked before, and a part at least are making big wages from their work.

The Nellie mine, near Crook Canyon, has been sold to E. E. Kenedy of Denver, the price paid being $2000. It is a free-gold property worked years ago.

Mark Murphy, superintendent of the Peck, is preparing to place a pumping plant on that property to drain the mine. The old workings are being drilled into near the surface. Mr. Murphy says the footwalls in the upper level were never reached in the early workings, and the result is thousands of dollars in horn silver ore has been found.

Placer mining is going on everywhere around this section. Where water is not to be had the dry machine is substituted, and in some dry gulches the gold-pan miner handles the dirt in such a manner that excites admiration over the novel method men have of working when necessity pushes them to it. "Dry panning" is adopted in but few instances, and some miners have become quite expert in such work.

Unauthenticated reports say that rich ore has been run onto in the old Senator mine, the strike taking place in the deepest workings. As to the extent of the vein or its value nothing is known other than that samples of ore indicate at least $300 per ton, being of a sulphate character.

DOS CABEZAS.—*Prospector:* The mines at Dos Cabezas continue to produce steadily, and the shipments of bullion from that camp are made occasionally. There has been a good deal of development work done in camp within the past few months, and it is expected that the list of productive mines will be increased considerably before the end of the year.

IN THE HUACHUCAS.—The rich strike recently made at the Copper Glance mine in the Huachucas attracts attention. Some of the ore that is being taken out is rich enough to ship without concentration. The ore is a well-defined streak of black color thirty inches wide.

MEXICO.

GOVERNMENTAL MINT CONTROL RESUMED.—Under the new law which went into effect last Monday the Government of Mexico resumes control of the mints, and will levy a uniform tax of five per cent on all gold and silver contained in the ore mined in the country, without regard to where it is smelted. For several years the mints have been leased to private individuals, who, while they have charged a mintage tax, have put it on a somewhat different basis from that proposed by the Government. The charge for minting gold and silver has been almost 4½ per cent, while the Government has collected in addition .61 of 1 per cent, making a tax of over 5 per cent to be paid by all Mexican mine owners having their ores coined into money in Mexico, while those who sent their product to smelters either in the United States or Mexico escaped this tax. It was this condition of affairs that induced the Government to assume control of the mints and to tax all ore, irrespective of where it is treated.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING JUNE 25, 1895.

541,536.—HOSE COUPLING—W. Curlett, S. F.

541,725.—BRICK MACHINE—W. E. Damon, Pomona, Cal.

541,559.—STEAM GENERATOR—A. Heberer, Alameda Cal.

541,624.—TUNING PIN—H. Muller, S. F.

541,486.—CAR COUPLING—J. C. Parrott, Pullman, Wash.

541,780.—ELEVATOR—S. M. Philbrick, Portland, Ogn.

541,500.—ELECTRIC CONTROLLER—O. H. & A. F. Pieper, San Jose, Cal.

541,681.—SUSPENDERS—H. Pulz, S. F.

541,792.—SAFETY PIN—J. Schary, S. F.

541,540.—ROLL PAPER PRINTER—Sullivan & Mathews, Seattle, Wash.

24,432.—BADGE DESIGN—W. N. Brunt, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CONDUIT ELECTRIC RAILWAY SYSTEM.—Charles M. Allen, S. F. No. 540,569. Dated June 4, 1895. This invention relates to a novel means for transmitting the current from the main conductor to the moving car by means of a series of successive contacts which are made as the car passes, and are broken immediately after. In carrying this out, an underground conduit is employed having a slot made in the side of the upper part, a contact bar extends downwardly from the car through this slot having conductors passing through arms from the contact bar to connect with the motor machinery of the car, contact boxes fixed at intervals within the upper part of the tube or tunnel and near the line of travel of the contact bar of the car, interior insulated boxes with stationary plates, clamps extending from the main conductor through one side of each of the boxes connected with stationary contact plates so that the latter are connected directly with the main conductor, and movable contact plates, the shanks of which extend outwardly through another side of the box with rollers upon their outer ends with which the contact bar of the car impinges as it passes so as to force the interior plates into contact with each other. These plates are separated by a spring as soon as the bar has passed.

FINGER-RING TWINE CUTTER.—James Wallace, Oakland, Cal. No. 540,930. Dated June 11, 1895. This invention relates to a device for cutting twine. It consists of a ring adapted to fit the finger, having its rear side extended to form a broad bearing; an arched blade extending approximately parallel with the ring axis, provided with projections by which it is secured so that the point projects slightly over the front edge of the ring, and the inner edge of this knife is sharpened so that any thread or twine to be cut can be easily passed beneath the point and drawn across the cutting edge. This device is very suitable for salesmen, as it can be worn upon the finger and in such position as to be in readiness to cut twine after packages have been done up.

FAUCET.—A. H. & T. A. Schleuter, Oakland, Cal. No. 540,844. Dated June 11, 1895. The object of this invention is to provide a faucet which is especially applicable to oil cans, so that by the use of the faucet a lamp or other receptacle may be filled directly from the faucet, and will not overflow while filling, the structure of the faucet being of such a nature that after the filling, the faucet closed and the lamp removed, there will be no leak or drip from the faucet. It consists of a closed chamber having a flat seat with segmental openings upon opposite sides, one of which connects through a passage with the interior of the vessel to which the faucet is attached, the other one connecting with the discharge spout. A valve is adapted to close both of said openings simultaneously by turning the screw stem thereof, and in conjunction with this is an air channel, formed in the side of the screw stem, which admits air into the valve chamber when the valve is closed and which is cut off therefrom when the valve is opened. Another air passage extends from the interior of the valve chamber alongside the discharge spout to near its lower end. A second spout extends from the opposite side of the valve chamber into the can and thence to the top projecting above the surface of the liquid. A lug projects from the bottom of the valve face corresponding with the inlet opening in the seat, and this lug enters the opening when the valve is closed and is withdrawn therefrom when the discharge opening has been fully exposed to the rising of the valve.

ADJUSTABLE BUTTER MOLD.—Herbert S. Malthy, Clarksville, Cal. No. 540,839. Dated June 11, 1895. This invention relates to that class of butter molds in which provision is made by the use of a filling strip between the meeting edges of the mold sections for following the capacity of the mold to compensate for changes in temperature and shrinkage, thus adapting the mold for the production of molds or squares of given weight under any circumstances. The invention consists in a butter mold, between the meeting edges of both the back and front of which are seated filling strips, and also in a mold having in addition to said filling strips the back edges of its sections adjustably connected by its hinges, whereby the mold may be additionally varied in capacity and inaccuracies attendant upon such increased capacity corrected.

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NUMBER XXX.

Written for the MINING AND SCIENTIFIC PRESS and copyrighted 1894, by Henry G. Hanks, F. G. S.

Thousands of individuals may enjoy the comfort, convenience and cheapness of natural gas in California for domestic purposes.

The water flowing with the gas from these wells, having an unpleasant saline taste, is not used except for bathing purposes, for which it is admirably suited. The temperature, as it flows from the wells, is quite uniformly 89° Fahr. It is really a mineral water, and sometimes may be found valuable as such. The flowing water leaves a yellow sediment of sesqui-oxide of iron and a trace of petroleum on its surface. My analysis of the water from the "Citizens' well" gave the following result: Specific gravity, 1.003; total solid grains in gallon 319.28; equivalent to parts in 100,000, 547.50.

The taste was saline; reaction slightly alkaline. On standing, a sediment fell which consisted of sesqui-oxide of iron and a little very fine sand. When evaporated to dryness common salt crystallized out, and the chlorine present was equivalent to 292.8 grains of salt in one U. S. wine gallon, but there was no proof that all the chlorine was so combined. The bases found were iron, lime, magnesia, silica sodium and a little organic matter. The acids were sulphuric, phosphoric, carbonic and chlorine

In one of the bathing establishments of the city the water is changed once in twenty-four hours. When the tank is refilled an iridescent scum floats on the surface. This is removed by drawing a floating scantling from one end of the tank to the other. An examination of this scum shows it to be composed of sesqui-oxide of iron and petroleum. The quantity is small. No gas well in Stockton ever produced more than traces of petroleum.

It is a question in my mind if the water is the active agent which, rising on the theoretical artesian principle brings up the gas mechanically to the surface; or if, on the contrary, the expansive force of the gas increased by pressure is not sufficient to lift the water. I am inclined to the latter opinion. That all the Stockton wells overflow and do not spout, and that no gas comes from any well that does not overflow, confirms me in this opinion.

As it is generally admitted that the Pennsylvania and Baku eruptive petroleum wells owe their energy to gas pressure, it is fair to assume that the same agent performs a similar labor in a less energetic manner in California—less energetic only because the quantity and pressure are less.

The drilling of the gas wells in Stockton is exactly similar to drilling for petroleum and artesian water. Boring is an operation quite different. One variety is called "hydraulic well sinking." Instead of solid iron stems for the tools, wrought iron pipes 2 to 3 inches in diameter are substituted. These are screwed together in lengths joined by sockets, as common gas or water pipes are joined. These sectional pipes connect with a bitt or cutter, driven by machinery making 40 revolutions per minute. A stream of water is forced by powerful steam pumps down through the tubes to the bottom of the well, which rising in the bore hole brings up most of the debris made by the tool. After a time it becomes necessary to remove the tools and use the sand pump in the usual manner, thus clearing the bore hole of coarser fragments which the force of water was not powerful enough to eject. This operation is continued until the required depth is attained.

I have been informed that some years before gas was discovered in Stockton, a well was sunk on Union Island 15 miles below that city, which at a depth of 1500 feet, began to flow mineral water, accompanied by inflammable gas, but the object being good water, no attention was paid to the gas.

That natural gas rises with artesian water in the city of Stockton is no new discovery, for as early as 1858 a well was drilled near the court house which delivered water foaming with gas. This excited but little interest at the time, but was mentioned in the papers as a curiosity, and was occasionally referred to as such until 1883, when a well sunk one mile south of the city by J. D. McDonald produced the same mechanical mixture of gas and water. When the well had reached a depth of 975 feet it was proved by experiment that 15,000 cubic feet of gas came up daily with the water. This quantity of gas would fill a cubic space with sides 25 feet square. Mr. McDonald has continued to use natural gas in his family ever since. This was the first use of gas in Stockton, if not in the State.

About the same date (1883) the Stockton Water Company, seeking water in the eastern part of the city, found gas, which was immediately set to work giving light and heat. These successful ventures gave confidence to capitalists, and other wells were undertaken.

(To be continued.)

Pacific Coast Diamonds, Etc.

Dr. David T. Day, chief of the mining statistics division of the Geological Survey, has completed his annual report, in which he says:

W. P. Carpenter of Placerville, Cal., who has from time to time reported the finding of diamonds in auriferous gravel, under the usual conditions of their occurrence, on the Pacific coast, has lately obtained two crystals—one weighing over seven grains troy and the other six, of rounded form and rough surface, each nearly one-fourth of an inch in diameter, and faintly tinted, the larger with a greenish shade and the smaller with a pale yellow. As many as forty or fifty small diamonds have been taken from the gravel at this place from time to time in the past; but since the stamp mills have been employed, little is found but the crushed fragments encountered in panning up. Mr. Carpenter proposes to work his section of the channel by other means and avoid the possible loss of diamonds of more value than the gold. The occurrence is similar to that of other California diamonds, in the hard, compacted, gold-bearing gravel occupying ancient river channels now filled and overlain by rocks. The rumor of the discovery of brilliant diamonds at Mount Edgecombe, near Sitka, Alaska, is without foundation, being denied by John G. Brady of Sitka, who says that the report arose from his remarking that diamonds might possibly be found on Mount Edgecombe, where, he thought, the geological formation presented resemblances to the South African diamond fields. In the chapter by George F. Becker, on a reconnaissance of the gold fields of the southern Apalachians, he states: The direct association of gold and diamond anywhere in the world is known only in one instance, and this has never before been described in print. Professor Arzruni showed me the specimen, exhibiting it some years ago, and now gives me permission to make it known. In 1887 the Royal Polytechnic High School at Aachen acquired from Ernst Winter, a diamond dealer in Hamburg, Eimsbuttel, a gray, opaque, flawed Kimberly diamond, which shows at two points inclusions of native gold in grains. It seems that this native gold must be considered as a constituent of the basic eruptive rock in which the Kimberly diamonds occur.

DIVIDEND NOTICE.

The German Savings and Loan Society,

526 California Street.

For the half year ending June 30, 1895, a dividend has been declared at the rate of four and eight-tenths (4 8-10) per cent per annum on Term Deposits, and four (4) per cent per annum on Ordinary Deposits, free of taxes, payable on and after MONDAY, July 1st, 1895.

GEO. TOURNY, Secretary.

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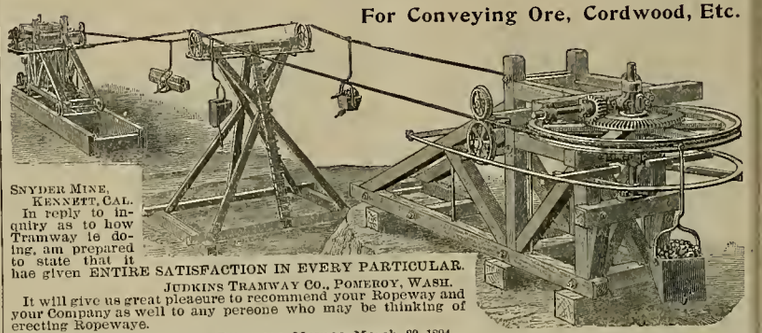
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It will give us great pleasure to recommend your Ropeway and your Company as well to any persons who may be thinking of erecting Ropeways.

SAN ANDREAS, DURANGO, MEXICO, March, 20, 1894.

I desire by this letter to testify that the Vulcan Wire Ropeway furnished to this Company by your Works, and erected by your engineer, B. McIntire, is of the very best class, and has given us entire satisfaction since its installation.

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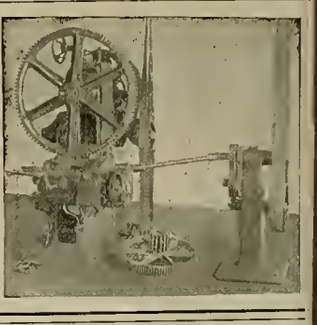
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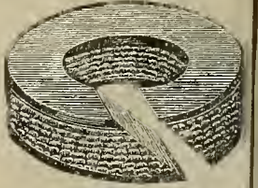
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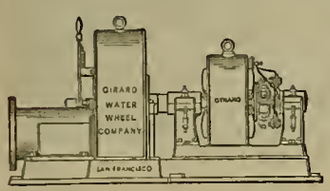
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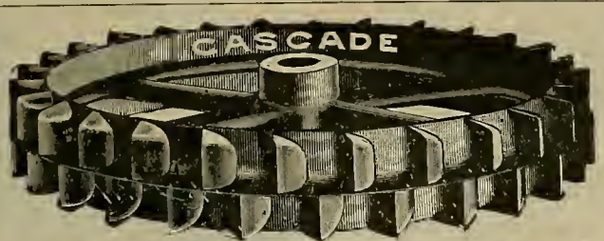


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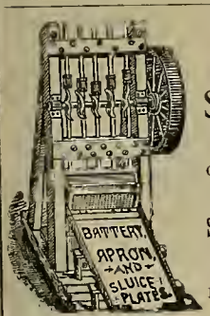


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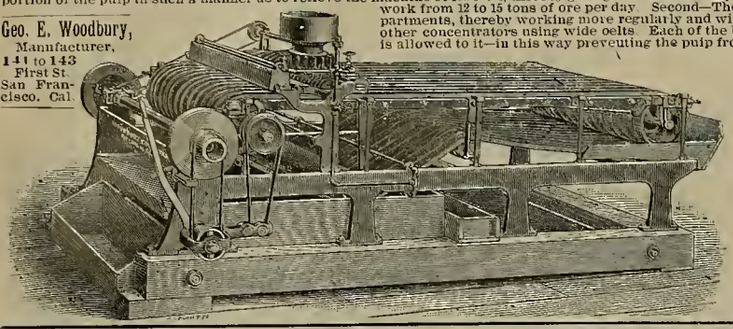
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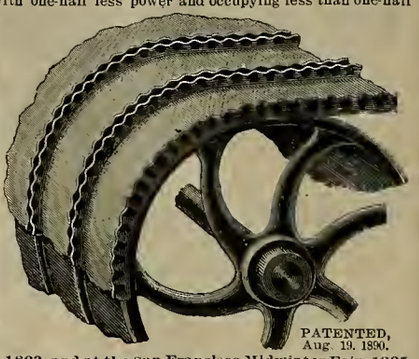
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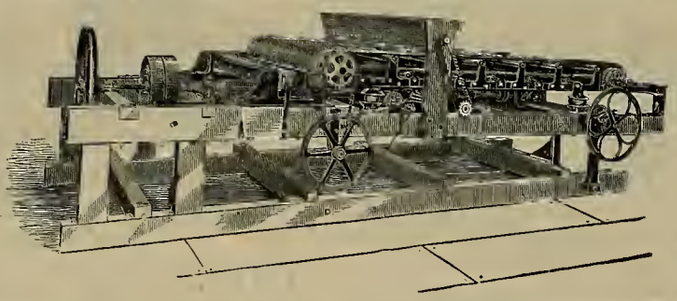
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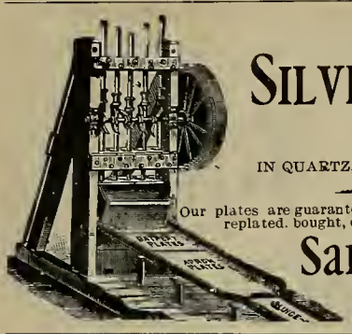
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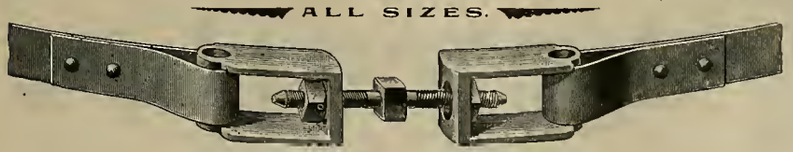
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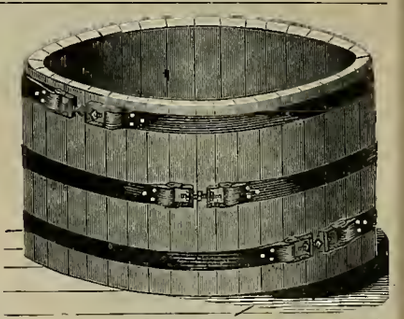
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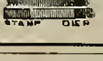
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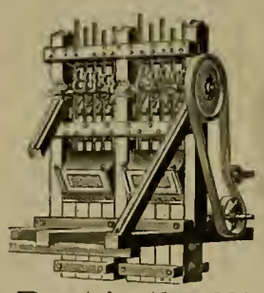
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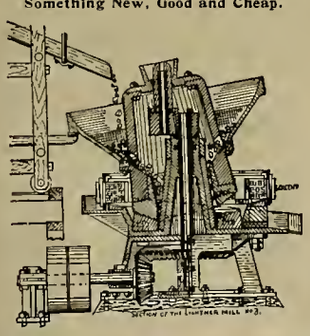
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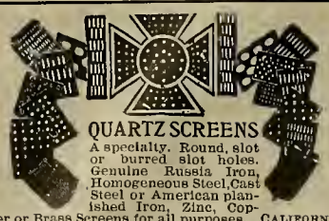
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Market Reports.

The Markets.

SAN FRANCISCO, July 3, 1895.

The markets have been practically unchanged since the last report, a good demand keeping metals throughout about at last week's figures.

By the fourth article of the Shimonoseki treaty the war indemnity to be paid by China is two hundred million taikwan talls, or 288,800,000 silver Mexican dollars. The taikwan is the imperial treasury tael.

That the price of wheat has for many years run on a line with that of silver is shown by the following return of the price of silver per ounce and the average price of English wheat since 1873. In that year the average price of silver was 59¼d per ounce; the average price of wheat 58s 8d per quarter. In 1874 silver was 58 5-16d, wheat 55s 8d; 1875, silver 56⅞d, wheat 45s 2d; 1876, silver 52¾d, wheat 46s 2d; 1877, silver 54 13-16d, wheat 56s 9d; 1878, silver 52 9-16d, wheat 56s 5d; 1879, silver 51¼d, wheat 43s 10d; 1880, silver 52¼d, wheat 44s 4d; 1881, silver 51 11-16d, wheat 45s 4d; 1882, silver 51½d, wheat 45s 1d; 1883, silver 50 9-16d, wheat 41s 7d; 1884, silver 50⅝d, wheat 35s 9d; 1885, silver 48⅝d, wheat 32s 10d; 1886, silver 45¾d, wheat 31s 2d; 1887, silver 44⅝d, wheat 32s 6d; 1888, silver 42¾d, wheat 31s 10d; 1889, silver 42 11-16d, wheat 29s 9d; 1890, silver 47 11-16d, wheat 31s 9d; 1891, silver 45 1-16d, wheat 37s; 1892, silver 39 13-16d, wheat 30s 4d; 1893, silver 35¾d, wheat 26s 4d; 1894, silver 28 15-16d, wheat 23s. That the present advance in wheat is in excess of present appreciation in the price of silver is accounted for by the fact that there is an enormous shortage in the wheat crop, the aggregate wheat yield being the least since '88, while the number of consumers has increased, an unusual factor in the great equation of supply and demand.

New York Metal Market.

NEW YORK, July 3. — PIG IRON—Scotch, 19@20c; American, 11.00@12.50c.

COPPER — Brokers', 10@10.50c; exchange, 10.55c.

LEAD—Brokers', $3.12½; exchange, $3.22½.

TIN—Straits, 13.85@13.95c.

SPELTER—Domestic, $3.60.

New York Silver Prices.

NEW YORK, July 3.—Following are the closing prices for the week:

	Silver in—			
	London.	N. Y.	Copper.	Lead.
Friday	30¼	66¼	10 50	.....
Saturday	30¼	66¼	10 50	3 12½
Monday	30¼	66¼	.....	3 12½
Tuesday	30¼	66¼	.....	.....
Wednesday	30⅜	66⅜	10 50	3 12¼

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sigbt Draft	2½c
New York Telegrapbic Transfer	5c
London Bankers' 60 days	$4.88¾
London Merchants	$4.87½
London Sigbt Bankers	$4.89¾
Refined Silver, per ounce	65½c
Mexican Dollars, nominal	54c

San Francisco Metal and Coal Market.

ANTIMONY.			
Per lb	—	@	10
COPPER.			
Bolt	¼ & 5-16, 17c; ⅜ and larger, 16c		
Lake Superior Sbeatbing	18	@	—
Ingot, jobbing	—	@	14
Ingot, wbolesale	13	@	12
Sbeet copper	—	@	17
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
Englisb, lb	14	@	16
COAL.			
SPOT FROM YARD—PER TON.			
Wellington	$ 8 00		
Greta	7 75		
Nanaimo	6 50		
Gilman	6 00		
Seattle	6 50		
Coos Bay	5 50		
Cannel	8 00		
Egg, bard	12 50		
Wallsend	7 50		
Scotcb Splint	7 50		
Brymbo	7 50		
West Hartley	8 75		
TO ARRIVE—CARGO LOTS.			
Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lebigb Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, bard	10 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'	75c	₱	bbl
Englisb, to load	9 00	@	10 00
" spot, in bulk	—	@	11 50
" in sacks	—	@	12 50
Cumberland	9 00	@	— —
ZINC.			
Sbeet	8¼@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sbeet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do. " "			1 45
QUICKSILVER.			
Home trade, per flask	41 00	@	— —
TIN PLATE.			
Per bx	5 25	@	6 00
PIG TIN.			
Per lb	15	@	16 00
BORAX.			
Refined, in car lots	—	@	5¼
Powdered, "	—	@	5½
Concentrated, "	—	@	5
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00
NAILS.			
Wire			$2 10
Cut			1 90

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alpba Con, Nev	14	5c	May 23, Jun 27, July 18	C E Elliott, 309 Montgomery
Best & Belcher M Co, Nev	58	25c	June 12, July 18, Aug 10	M Jaffe, 309 Montgomery
Bullion M Co, Nev	45	10c	June 12, July 17, Aug 7	R R Grayson, 331 Pine
Challenge Con M Co, Nev	19	5c	June 11, July 16, Aug 6	C L McCoy, Mills Building, City
Ci ollar M Co, Nev	40	25c	May 14, Jun 15, July 11	C E Elliott, 309 Montgomery
Gold Bar Cons M Co., Cal	1	2c	May 24, Jun 29, July 22	E C Godfrey, Crocker Building
Gould & Curry, Nev	76	15c	July 2, Aug 6, Aug 28	A K Durbrow, 309 Montgomery
Hale and Norcross M Co	107	20c	May 29, July 3, July 25	A B Thompson, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19, May 31, July 26	J Henry Smith, 431 California
Mexican G & S M Co, Nev	52	25c	May 13, Jun 17, July 10	C E Elliott, 309 Montgomery
Occidental Con M Co. Nev	19	10c	June 25, July 30, Aug 21	A K Durbrow, 309 Montgomery
Sonora Extended M Co, Cal	2	2½c	June 1, July 6, July 27	C A Stratton, 213 Jackson
Union Con	51	20c	June 18, July 19, Aug 15	A P Swain, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Best & Belcher M Co, Nev	M Jaffe, 309 Montgomery	July 8
Overman S M Co, Nev	G D Edwards, 414 California	July 11
Union Cons M Co, Nev	A P Swain, 309 Montgomery	July 15
Yellow Jacket, Nev	W H Blauvelt, Mills Building	July 15

Mining Share Market.

SAN FRANCISCO, July 3, 1895.

Practically nothing was done this week, the exchanges adjourning last Tuesday till the 8th inst. The Comstocks advanced a little. Interest in the dilatory Hale & Norcross decision is unahated. It is thought that the decision will he favorable to the shareholders. They have been waiting with diminishing patience since the 22nd of last January, the stock meanwhile fluctuating from $5 to 75 cents. At present it is quoted at $1.10

The usual monthly financial statements are as follows:

Bodie Mines — Bodie, $16,187.75, Bulwer, $297.38; Mono, $2,238.34; Standard, $29,070.03.

Comstock Mines—Alpha, $5463.46; Alta, $5597.69; Andes, $14,534.07; Belcher, $925.80; Bullion, $2126.36; Best & Belcher, $195.35; Caledonia, $2723.98; Challenge, $294.19; Chollar, $23,837.12; Confidence, $5024.18; Con. Cal. & Virginia, $50,133.76; Con. Imperial, $331.98; Con. New York, $1674.76; Crown Point, $12,525.97; Exchequer, $1720.88; Gould & Curry, $3662.63; Hale & Norcross, $7279.50; Justice, $7092.66; Lady Washington, $1345.18; Mexican, $21,639.32; Occidental, $50.78; Ophir, $5923.98; Overman, $10,169.19; Potosi, $4331.05; Savage, $7753.56; Seg. Belcher, $3233.96; Sierra Nevada, $7278.64; Union, $3383.37; Utah, $270.13.

Indebtedness—Belle Isle, $2501; Navajo, $1305; North Belle Isle, $520; Silver King, $2947.

P. Kervin, superintendent of the Gould & Curry, Best & Belcher and Oshiston mines, has been appointed superintendent of the operations on the Brunswick lode, and work hegan thereon last Monday, a joint incline on that part owned by the Chollar and Hale & Norcross.

The following illustrates the changes of the week:

Mines.	27	1
Alpba	$ 10	$ 08
Alta Consolidated	19	16
Andes	30	27
Belcber	40	38
Best & Belcber	60	58
Bodie	28	27
Bullion	11	.....
Cballenge	28	.....
Cbollar	59	58
Confidence	95	.....
Consolidated California and Virginia	2 75	2 45
Consolidated New York	.....	.....
Crown Point	40	38
Exchequer	.....	.....
Gould & Curry	35	28
Hale & Norcross	95	1 10
Justice	14	12
Mexican	67	64
Opbir	1 60	1 40
Overman	23	19
Potosi	40	35
Savage	43	39
Sierra Nevada	60	60
Union	34	31
Utab	.....	.....
Yellow Jacket	46	39

San Francisco Stock Board Sales.

SAN FRANCISCO, July 1, 1895.

9:30 A. M. SESSION.

200 Alta	16	200 H & N	1 10
200 Best & Belcber	51	500 Julia	03
100	52	200 Mexican	62
350 Cbollar	57	400 Opbir	1 35
200 Con Cal & Va	2 40	200 Potosi	35
120	2 45	200 Savage	38
100 Crown Point	36	600	39
100	37	250 Sierra Nevada	37
500 Gould & Curry	28		

SECOND SESSION—2:30 P. M.

200 Alpba	08	100 Opbir	1 40
100 Alta	16	300 Overman	19
100 Andes	27	300	18
100 Belcber	38	50 Potosi	35
100 Bodie	27	100 Seg Belcber	03
100 Chollar	58	150 Sierra Nevada	60
100 Crown Point	38	200 Union	30
50 Hale & Norcross	1 10	300	31
100 Justice	12	50 Yellow Jacket	39
100 Mexican	64	50	38

MICHIGAN MINING SCHOOL, Hougbton, Mieb. A higb grade tecbnical scbool. Practical work. Elective System. Summer courses. Gives degrees of S. B., E. M. and Pb.D. Laboratories, Shops, Mill, etc., well equipped. For catalogues write to tbe Sec'y. M. E. WADSWORTH, Ph.D., Director.

ROASTING OF GOLD AND SILVER ORES (Second Edition) and the Extraction of their Respective Metals Without Quicksilver. By GUIDO KUSTEL M. E.

This rare book on the treatment of gold and silver ore without quicksilver is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe and the why and wherefore. It contains 156 pages, embracing illustrations of furnaces, supplements and working apparatus. It is a work of great merit, by an author whose reputation is unsurpassed in his specialty. Price, $3, postpaid. For sale by THE MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

Assessment Notices.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 1st day of June, 1895, an assessment, No. 2, of 2½ cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the corporation, 213 Jackson Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 6th day of July, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on SATURDAY, the 27th day of July, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

CHALLENGE CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the eleventh day of June, 1895, an assessment (No. 19) of Five (5c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 35, third floor, Mills building, corner Bush and Montgomery streets, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the sixteenth day of July, 1895 will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the sixth day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

C. L. McCOY, Secretary.

Office—Room 35, third floor, Mills building, corner Bush and Montgomery streets, San Francisco, Cal.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the twelfth day of June, 1895, an assessment (No. 45) of Ten (10c) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 20, No. 331 Pine street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the seventeenth day of July, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on TUESDAY, the seventh day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office—Room 20, No. 331 Pine St., San Francisco, Cal.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 25th day of June, 1895, an assessment (No. 19) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of July, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 21st day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

GOULD AND CURRY SILVER MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees, held on the second (2d) day of July, 1895, an assessment (No. 76) of Fifteen (15c) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Sixth (6th) day of August, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the Twenty-eighth (28th) day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

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A Set of Office Rules.

In the J. R. Thomas Machine Company's office, Green Bay, Wis., the following is posted in a conspicuous place:

OUR OFFICE RULES.

Time allowed for interviews in business hours.

	Hours.	Min.	Sec.
Friendly calls	0	2	0
Friendly calls when husy	0	1	0
Life insurance agents	0	0	⅓
Book agents	0	0	0
Friends with a great scheme	0	0	5
Same willing to let us in on the ground floor	0	0	1
Friends who want us to go fishing	0	0	42
Friends who want us to go to lunch	0	10	0
Friends who want to horrow $5	0	0	3
Friends who want to borrow $10	0	0	2
Friends who want to borrow over $10	0	0	0
Traveling salesmen with expense accounts	2	30	0
Traveling salesmen paying their own expenses	0	2	30
Bores, male	0	1	0
Bores, female	0	0	0
Customers in general	6	0	0
Customers who want to buy.	12	0	0
Customers who want to huy at list price		No limit.	

DELINQUENT SALE NOTICE.

GOLD BAR CONSOLIDATED COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 24th day of May, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
John E. Todd	5	2,500	$ 50 00
John E. Todd	6	2,500	50 00
John E. Todd	7	2,500	50 00
John E. Todd	55	2,500	50 00
Jas. P. McCarthy	13	625	12 50
Jas. P. McCarthy	63	2,500	50 00
Jas. P. McCarthy	64	2,500	50 00
Jas. P. McCarthy	65	2,500	50 00
Jas. P. McCarthy	66	2,500	50 00
W. A. H. Connors	14	625	12 50
W. A. H. Connors	52	1,800	36 00
John H. Page, Trustee	22	500	10 00
John H. Page, Trustee	23	500	10 00
John H. Page, Trustee	84	9,000	180 00
C. A. Moore, Trustee	28	5	10 00
C. A. Moore, Trustee	29	4,995	99 90
C. A. Moore, Trustee	30	16,666	333 32
I. N. Pattison	53	1,000	20 00
J. S. Herron	41	300	6 00
E. C. Godfrey, Trustee	74	6,000	120 00
E. C. Godfrey, Trustee	57	1,000	20 00
E. C. Godfrey, Trustee	58	500	10 00
E. C. Godfrey, Trustee	59	500	10 00
E. C. Godfrey, Trustee	60	200	4 00
E. C. Godfrey, Trustee	85	2,500	50 00
E. C. Godfrey, Trustee	86	4,000	80 00
Louise V. Rugg	36	10,000	200 00
A. U. Rugg	33	16,667	333 34
F. R. Harris	42	1,000	20 00
F. R. Harris	43	1,000	20 00
F. R. Harris	44	1,000	20 00
F. R. Harris	45	1,000	20 00

And in accordance with law, and an order from the Board of Directors, made on the 24th day of May, 1895, so many shares of each parcel of such Stock as may be necessary will be sold at public auction at the office of the Company, Room 37, Crocker Building, corner Montgomery and Market streets, San Francisco, California, on Monday, the 22nd day of July, 1895, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

E. C. GODFREY, Secretary.

Office—37 Crocker Building, San Francisco, California.

DELINQUENT SALE NOTICE.

H. P. TAYLOR MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Liberty Mining District, Siskiyou county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 19th day of April, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
William Patterson	7	12,492	$499 68
Howard P. Taylor, Jr.	8	12,493	499 72
J. Henry Smith	9	12,492	499 68
Howard P. Taylor, Jr., Trustee	10	12,498	499 92

And in accordance with law and an order from the Board of Directors made on the 19th day of April, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 39 Merchants' Exchange, 431 California street, San Francisco, California, on FRIDAY, the 26th day of July, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. HENRY SMITH, Secretary.

Office, Room 39 Merchants' Exchange, No. 431 California street, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Frederick Joubert, in the Joubert mine, near Oak Valley, Yuba Co., to impound tailings in an old pit and behind dams in Willow Creek; from George Parent, in the Tippecanoe mine, near Camptonville, Yuba Co., to impound tailings behind dams in Spanish Ravine; from W. R. & M. J. Williams, in the Galena Hill mine, near Camptonville, Yuba Co., to impound tailings in an old hydraulic pit; from E. C. Cochrau and Charles Turner, in the Atom mine, near Camptonville, Yuba Co., to impound tailings behind dams in Williamson Creek; from William Wellman, in the Young's Hill mine, near Camptonville, Yuba Co., to impound tailings behind dams in a ravine; from M. V. Turner et al, in the Horse Valley mine, at Wood's Point, Yuba Co., to impound tailings behind dams in Horse Valley Creek; from Michael Cortez, in the Sailor Boy mine at Brandy City, Sierra Co., to impound tailings behind the Brandy City Co.'s dam, in an old hydraulic pit; from Fournier & Barrere, in the Charcoal Ranch mine, near Loganville, Sierra Co., to impound tailings behind dams on a flat; from D. O. Keeffe, in his mine near Loganville, Sierra Co., to impound tailings in an old hydraulic pit; and from the Plumas Imperial Gold Mining Co., in its mine near Quincy, Plumas Co., to impound tailings behind a dam in Rock Creek, gives notice that a meeting will be held at Room 92, Flood building, San Francisco, Cal., July 8th, 1895, at 1:30 P. M.

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MacArthur-Forrest Process.

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Steam Pumps. ✦ Steam Engines.
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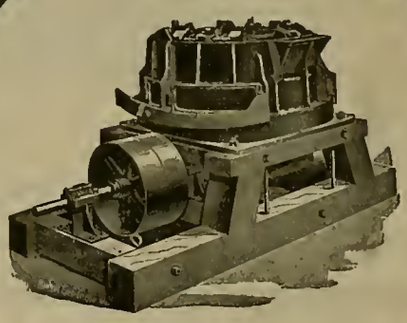


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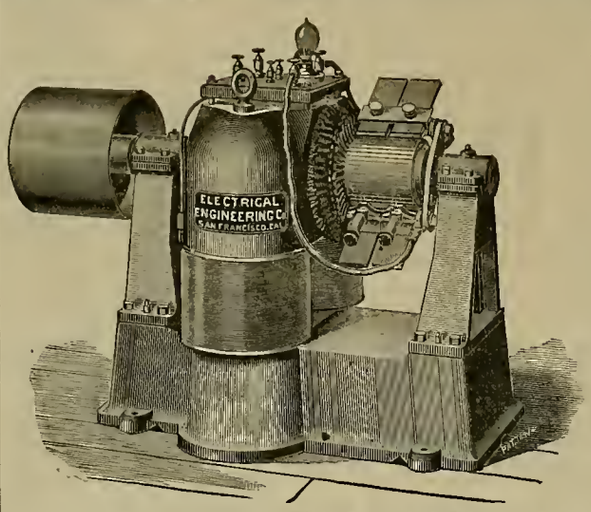
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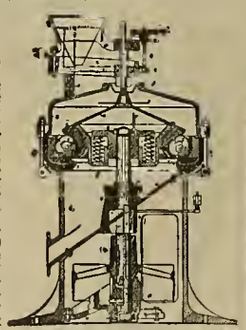
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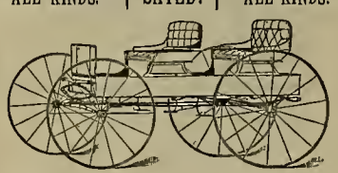
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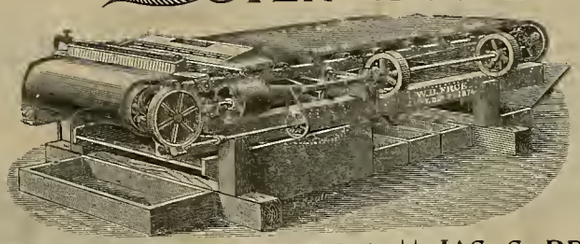
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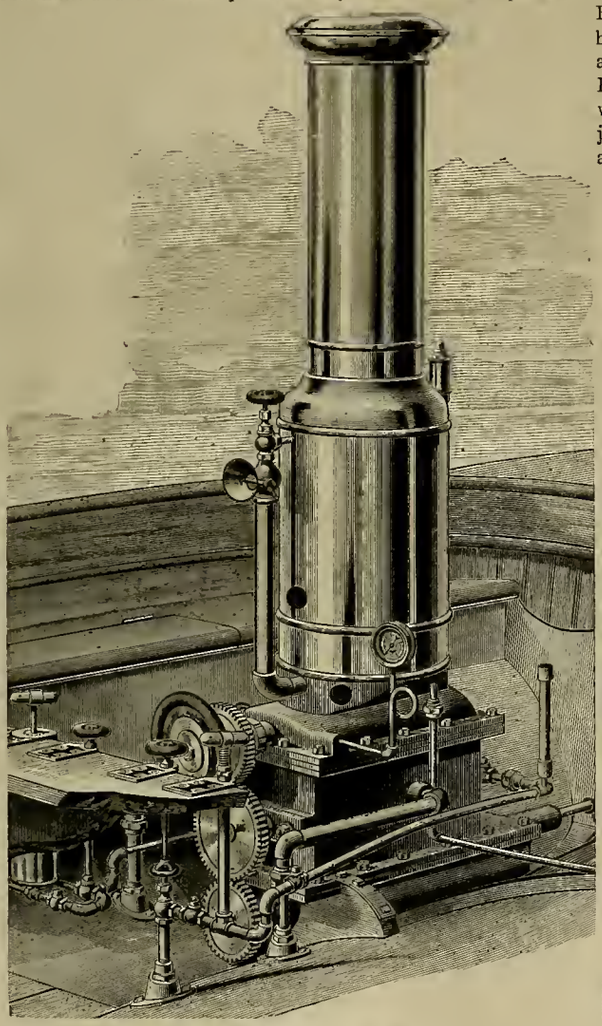
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The Naphtha Launch.

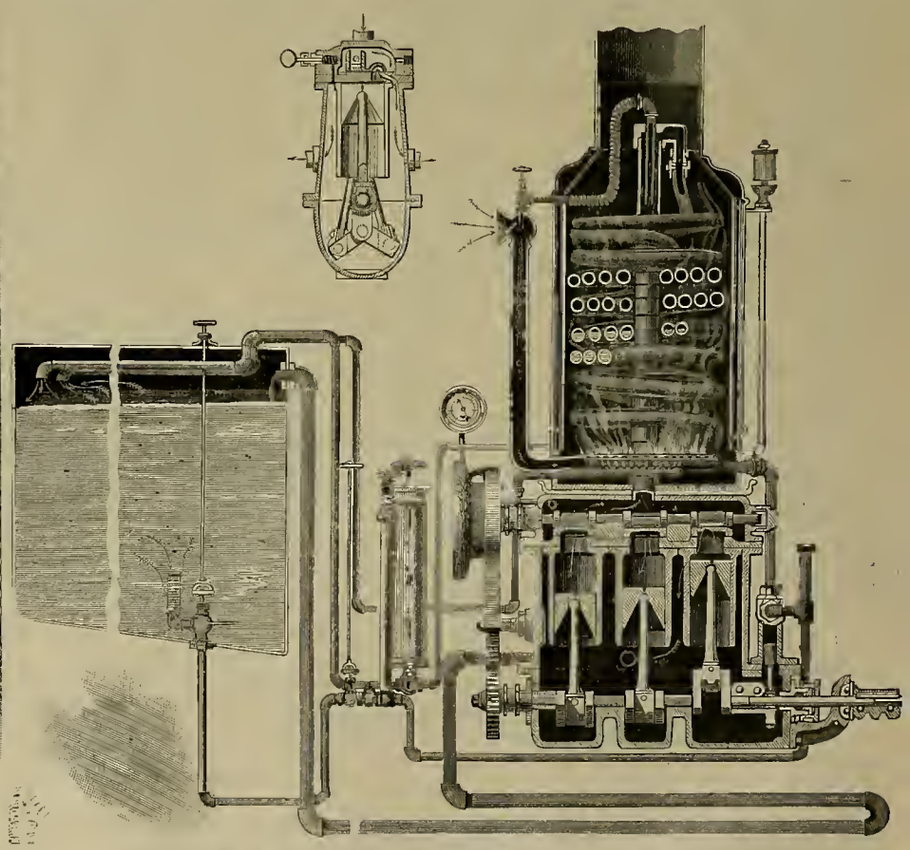
Among other forms of generating and utilizing power for marine purposes the naphtha launch attracts cousiderable present attention. Herewith is presented illustrations of an engine and hoiler of the American. The accompanying description is compiled from the *American Shipbuilder*, the *Scientific Machinist* and circulars published by the manufacturers—Amory, Harmon and Mayo, Morris Heights, near New York City:



THE NAPHTHA LAUNCH.

The engine is a three-cylinder, single-acting machine, especially constructed for naphtha, although it will work with steam or compressed air. It is surmounted by a douhle asbestos-lined jacket. Within the jacket is a coil of pipe, immediately helow which is a burner for naphtha gas, or vapor. A tank for holding the naphtha is placed in the extreme bow of the boat. From the tank a pipe connects with a small pump at the hase of the engine, hy which naphtha is pumped into the coil of pipe. Into the top of the coil boiler a pipe is tapped that supplies naphtha to the burner. In operation the coil is first made hot. This is done by hand-pumping naphtha vapor mixed with air into the burner, where it is lighted. When the coil is hot, naphtha is pumped into it. This is at once vaporized and develops pressure. The pressure is turned on the engine, which in a few minutes starts to rotate. An injector cock supplies the hurner with naphtha, drawing air in also, and the engine thercafter takes care of itself.

At each stroke naphtha is pumped iuto the coil hy the eugine. This develops in ordinary practice a pressure of sixty-five pounds in the heated coil. From the top of the coil the naphtha vapor, hefore it reaches the hurner, is drawn off and mixed with air after the fashion of the Bunsen burner. It hurns below the coil with a clear, hlue flame. Near the injector is a damper hy which the supply of air is regulated so as to produce this character of flame. After the naphtha vapor has acted upon the pistons and goes off through the exhaust it is condensed. A regular outhoard condenser is employed, the pipes running along outside the garhoard of the boat. The naphtha thus condensed is forced hack into the tank to be used over and over agaiu. The delivery of naphtha from the tank can he cut off by a special valve, which, however, in practice never need he closed.



SECTIONAL VIEW OF ENGINES AND BOILERS.

The eugraving shows its three cylinders with the piston rods bearing against hard steel cups beneath the pistons. Each piston is surmounted by its own slide valve, which slide valves are operated by a triple crank shaft. The burner and naphtha coils and the construction of the injector valve, nozzle and air damper are also made clear. Leading out to the right is seen the shaft, whose thrust is taken hy a hall hearing, which is seen in sections immediately forward of the after sleeve coupling. In starting it air is pumped into the naphtha tank, escaping therefrom highly carhurcted, so as to provide what is practically a gas for starting the fire. The whistle is blown by a hand pump, or in some of the boats an air tank is established forward, which is kept charged with compressed air hy the engine, and the whistle is blown by this air. The air tank is located immediately aft of the naphtha tank. The working parts of the engine are completely encased, so that all leakage of naphtha goes direct to the exhaust chamber. Another point of safety is that the fire is taken direct from the boiler, so that if the feed pump should fail to work, shutting off the naphtha supply at the hoiler, the fire would at once go out, and the engine would stop.

THE Fillmore-street line in this city has from Broadway northward for several hlocks a 25 per cent grade. Ordinarily this would be too steep; an auxiliary device is employed in the shape of a cahle and two sheave wheels, one at the top, the other at the bottom of the hill. Around these the cable turns; a stationary grip at the top is attached to the drawhead of the descending car; the grip at the bottom is similarly fastened to the ascending car. This is helieved to be the steepest grade on any electric railway in the country and could only he operated in the manner outlined herein.

MINING AND SCIENTIFIC PRESS.

ESTABLISHED 1860.

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J. F. HALLORAN.....General Manager

San Francisco, July 13, 1895.

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SOMETIME ago it was estimated that a million dollars per mouth was being received in this city from the gold mines of this State. It is believed that the present receipts will average ahout $50,000 daily. There is a constant stream from quartz, drift and placer mines, and more prospecting and development work is going on than has heen known for years before.

THE State Mining Bureau assistants in the field, detailed by State Mineralogist Crawford, have begun work. During the next ninety days W. H. Storms will work in Amador, Calaveras, Tuolumne, Mariposa and Madera counties; E B. Preston will operate in Butte, Plumas, Sierra, Lassen and Tehama counties; F. H. Mathyas iu Humboldt, Mendociuo, Del Norte and Siskiyou counties. W. L. Watts will continue his investigation of the southern California oil fields, his operations heing largely in Ventura, Los Angeles and Sauta Barbara counties; and J. H. Means will operate in Monterey, San Luis Ohispo, Kern and Kings counties. As a matter of puhlic interest and general value it is in order for any and all owners of mines, or any form of mineral interests, to co-operate with this State institution in furnishing information whenever desired.

IT is a pleasure to uote the practical efforts of the Manufacturers' and Producers' Association, which is doiug effective work in securing a fair opportunity for California's home industries. The State has everything that makes a great commonwealth, a great deal more than many other States in the Uniou, and coucert of effort is chiefly needed to make the matter of developmeut not so much one of silent precept as of active duty. The province and purpose of the Manufacturers' and Producers' Associatiou is not one of selfishness or exclusiveuess, as has been intimated. It is practical philanthropy, directing public attention to the fact forgotten or overlooked by so many that it is business to patronize home industries; that it is progress to pay the money that must be paid anyhow, for things of equal merit produced here, and that California goods made by men who employ Californians will have the preference where equal in price and quality. Two propositions are now before the Association—to put a distinctive lahel on goods of California manufacture and to incorporate the organization itself. The incorporation idea is feasible. The hadge of locality can best be determined by superiority of quality and increased attention attracted to the fact.

Coal Deposits of Kachemak Bay, Alaska.

The arrival at this port of the American hark Theohald with a cargo of coal from Alaska renews interest in Kachemak hay, Cook's Inlet, in the northernmost part of that territory. This coal indicates its prohable importance. Like all coals on this coast it has a considerable percentage of water, which, while against if for coking, is in its favor for other purposes. Tests, some of which were extended over a period of several months, of the coal have demonstrated that it burns clean, is remarkably free from soot and smoke and has good heating qualities, and while with a strong draft it will buru rapidly, yet with a light draft it will make a strong and hot fire lasting for a considerable time. From all information ohtaiuable it seems not unlikely that this coal may aid in solving the prohlem of cheap fuel supply for use in manufactures, steam vessels and some domestic purposes.

These coal deposits embrace a territory of 300 square miles. They underlie that portion of the peninsula hetween Kachemak hay and Cook's Inlet. How much of this is practically availahle has not as yet been determined, but surveys and examination have shown the existence of large quantities. Eighteen veins have heen examined, which vary in thickness from a few inches to five and six feet. The coal in these veins differs in quality, some heing of sufficient thickness aud character to warrant profitable working. As the entire geological formation of the coal deposits belong to the Miocene period, they are of a lignitic character, some being very frail, decomposing or crumbling on exposure to the atmosphere, while others are strong and highly carhonated and will stand shipment as well as any coast coal. Owing to their peculiar local conformation (dipping into the mountain at a decline of not more than two feet to the mile), they can be mined at a comparatively small cost, no shaft work or heavy pumping being required, ohviating the need of an expensive plant to he maintained.

Mr. George R. Tuttle, who has spent many years in coal and gold mining, made a personal visit to these coal deposits in Alaska. He says this coal is desirahle for grate and all kinds of domestic use, for which it takes rank alongside of Scotch Splint, while for manufacturing and general economic purposes these coals will he found among the hest varieties hrought to this market. Very little of the "Alaska Splint" coal has heen hrought to San Francisco, and that was taken from the outcropping of the vein, where it had become air-slacked and devitalized by exposure to the elements. It is thought that when the present company—the North Pacific Mining and Transportation Co.—shall have extended its mining operations farther into the formation, the quality of the coal produced will he still more desirable. While the distance to the coal fields is relatively much farther in miles than to our present hase of supplies in Washington and also iu British Columhia, yet the lesser expenses for mining, putting on vessels, and the ahsence of river tolls, harhor dues, towing, piloting, etc., will enahle the coal to be hrought from Alaska at sufficiently low cost to warrant entering into competition for the demand of this city and coast, and will yield to the owners a fair net profit.

The annual report of the Geological Survey is to hand; speaking of the production of coal in California during the past year the report says:

"The total product in 1894 was 67,247 short tons of a spot value of $155,620. The decreasing tendency of coal production in California noted in a preceding volume of the mineral resources continued in 1894. The largest product in any one year was ohtained in 1889, when it reached 121,820 short tons. In only one other year did it exceed 100,000 tons. This was in 1890.

"California coals are of inferior quality, mostly lignite and high in moisture or ash, or hoth. They can, however, and do, to some extent, act as a balancing wheel in keeping prices for other coal at a reasonable figure. Consumers are willing to pay higher prices for hetter coal, hut there is a limit beyond which it is found impolitic to go, and California lignites would be found cheaper fuel, notwithstanding their inferiority."

This fact should he horne in mind hy consumers in San Francisco, and encouragement should be giveu to the development of such mines as the State has. As it is, prices for coal in San Francisco have materially declined in the past few years. In 1890 English coal was selling at from $10 to $13 per ton. At the close of 1894 it was much cheaper. Such cheapening of fuel is of great henefit to manufacturers. It is true that the decline in value was originally due to heavy importations, chiefly in 1891, when the total receipts exceeded those of the previous years by nearly half a million tons and resulted in a glutted market, but unless there should he other resources for consumers to fall hack upon, the present low rate will not be apt to continue. The statistics for 1894 are as follows: Contra Costa county, total production, 39,200 short tons; Amador, Fresno and San Diego, 28,047 short tons, making a total for the State of 67,247 tons, valued at $155,620. In 1893 the total production was 72,603 tons and the total value $167,555.

FREQUENTLY California's annual gold yield is "going to he" exceeded hy that of other localities, hut so far statistics put it first iu the gold-producing localities of the continent. It is now asserted that the $15,000,000 gold which this State yearly produces will he exceeded hy the output of the Appalachian range, by reason of a new system of working sulphurets devised hy T. A. Edison. Mineralogists say that the free gold represents hut five per cent of the gold in Virginia and North Carolina; the other 95 per cent is sulphurets. Mr. Edison is represented as saying that he has an ore concentrator that will make profitahle the working of ore that goes $1 to the ton, and has hought a mine with "a great vein of pyritous gold ore" therein. He is also credited with having an "ore finder," which "operates on the principle of the compass," whereby "the needle is attracted, and not only the presence hut the character and extent of the ore helow the surface are indicated." The possession of all this should result in large increase in the gold output and augmentation of Mr. Edison's iudividual fortune, hut it is possible some of the newspaper statements may be slightly exaggerated, and very probahle that Mr. Edison is incorrectly quoted.

Electricity, the liveliest of all our electrical contemporaries, has for several months charged fraud, corruption, suhterfuge and general wrong doing among many most prominent in the electric husiness world, and of late claims that some of its contemporaries in that field are participants therein. In the current issue *Electricity* charges sundry electrical journals in New York and Chicago with dishonest methods and swindling intent. It goes on to assert that either the lines upon which the electrical husiness of the country has been conducted are fundamentally wrong, or else the electrical industry is a buhhle, the apparatus and devices sold not commercially practical, and the entire husiness of electric lighting and power transmission unstahle, short-lived and destined to give way to its competitors. It says that the past fifteen years have heen a period of dishonor and disgrace due to the lack of nerve and courage on the part of its contemporaries. This journal does not accept all these statements of *Electricity*. There is disappointment and jealousy and competition in the electrical world as anywhere else, and it is not likely that all the honesty, courage and good intent have found lodgment in the office of our virile contemporary. Yet it is evident that in more than one prominent instance the methods that alone insure permanent success have been ignored and practices permitted and perpetuated that are indefensihle. *Electricity* prohably says more than it means and aims higher than it desires to strike. Where not grossly ahused, the exercise of such criticism as that indulged in is usually provocative of good results, the danger being that exaggeration of statement and intemperance of language destroy all influence. One will heed a friendly warning or a sharp, deserved criticism, but continual scolding or constant vituperation rarely convert the sinner, electrical or otherwise.

Concentrates.

SANTA BARBARA is talking of an assaying and refining plant there.

FORTY-FIVE MEN are now at work at the Plumas-Eureka quartz mine at Johnsville.

A GOLD NUGGET weighing 146 ounces was recently found at Marble Bar, West Australia.

THE Morning Star gravel mine, at Iowa Hill, has declared another dividend of $3.50 per share.

THE Con. Cal. & Virginia carries over $33,525.56 into July with all the expenses for June paid.

THE Jackson Mining Company has been incorporated at Portland, Or.; capital stock, $16,000.

THE Eastern Washington Mining Company has incorporated at Spokane, Wash., capital stock, $50,000.

AT the Gwynfynydd and Clogan mines in Wales, 46,795 tons of gold ore stack '87 have yielded $442,830.

T. H. LEGGETT, F. Hollman and Jas. Meban sail from New York on the 21st inst. for Johannesburg, South Africa.

PERMITS have been issued by the Debris Commission to the Plumas Imperial and the Grizzly Bear mines, Plumas Co.

THE Pacific Bank mortgage of $22,000 against the Amador Queen mine was compromised for $15,000 last week.

THE "half-ton nugget of horn silver worth $80,000," recently found near Peach Springs, Arizona, turns out to be meteoric iron.

SINCE July 1 the charges for securing incorporation articles of a new company in Montana is $200; previously the cost was only $18.

A CHICAGO "mining paper" has an illustration of "a dry placer gold mining machine," with two streams of water running into it.

A POST OFFICE has been established at the Altoona quicksilver mine, known as Cinnabar. The Altoona is now producing 100 flasks a week.

HENRY GREENE, a pioneer miner of '49 and one of the original owners of the Gould and Curry, died last Sunday in this city in the 68th year of his age.

THE customs receipts at Rossland, B. C., for June amounted in round numbers to $7000. The mining receipts, with provincial taxes, reached a total of $3500.

THE Osceola Placer Company has resumed operations at Osceola, Nev. The two canals which supply the hydraulics are in use, and 100 men are employed.

THE *Record* says the Government will make preliminary survey of the mining regions of New Mexico and Arizona. A register of all the mines is to be made.

BRITISH COLUMBIA proposes a bonus of $30,000 a year for five years for aid to silver-lead smelting in that province at the rate of 15 cents per ton on the ore smelted.

J. B. HARRIS has bonded the Brunswick mine, Trinity Co., for $40,000, formerly owned by Weaverville parties, for sixteen months, with the privilege of prospecting.

MR. PRANGE, owner of the Sunset mine, Harqua Hala, Arizona, reports finding rich gold ore, which, in his opinion, justifies increasing his mill from ten stamps to sixty.

THE Golden Chariot Mining Co., in Ogilby district, San Diego Co., sixteen miles from Yuma, which recently added 60 stamps to their 20-stamp mill, are about to add 40 more.

THE Centennial-Eureka (Utah) mine last week declared an extra dividend of $1 per share, numbers 77 and 78, making the total amount of dividends paid by the property, $1,170,000.

THE gold output of the Witwatersrandt, S. A., district for May was 196,531 ounces, about 820 fine. Local journals estimate the year's output will be nearly 2,000,000 fine ounces.

A LONDON company is being formed to buy the Canyon Creek mines, Cœur d'Alene, Idaho; capital, $2,800,000. Nearly half a million has been spent in improvements and development.

THE Old Glory mine, Oro Blanco, Arizona, is now in the hands of a receiver, G. W. Cheyney. Suits have been brought for $14,000 by mining machinery men for money long since overdue.

PROFESSOR DALL and Dr. Becker of the Government Mineral Commission, now in Alaska, are reported to have discovered valuable nickel ore ledges at the head of Indian river, at Silver Bay.

THE Debris Commission have ordered the American House mine, in Plumas county, and the Cleveland mine, in Sierra county, to close down, on account of failure to comply with its directions.

IT is reported from Townsend, Montana, that the Diamond Hill mill and mine has been sold to a New York man for $1,500,000. J. S. Miller has been the manager and principal owner.

IT is reported that the turquoise mine near Tombstone, Arizona, is being worked at a profit. A recent shipment of fifty pounds of turquois was made to New York. Twenty men are working at the mine.

THE Ontario nickel mines, Leavenworth, Wash., have been bonded by Everett parties for $100,000. Sup't. Weber has charge of the work. The Ontario Mining Company has been organized; capital stock $500,000.

AT the Cananea (Mexico) mine last week the miners all struck for higher wages—$2 per day—an advance from $1.50. The raise was refused, and after a day in idleness the men returned to work at the old rate.

THE Butte & Boston Mining Company has begun a suit for $400,000 damages against the Lexington Mining Company for ore extracted from one of the plaintiff's mining claims by underground workings during 1894.

THE Troy Mining and Development Company has incorporated in this city, capital stock $100,000, of which $60,000 has been subscribed. Directors—M. Gruenberg, W. F. Mills, E. Hirshfeld, E. Stelzner and O. Ryst.

THE bullion statement of the Chollar mine for June is as follows: Worked at the Nevada mill, 420 tons of ore; gross proceeds in bullion, $11,468.74; cost of reducing, $2520; net proceeds in bullion, $8948.24; assay value per ton, $33.24; gross average per ton, $27.36; net average per ton, $21.36. Mill work up to 82.3 per cent.

MR. MCGRATH, of Los Angeles, has completed his roaster and chlorination plant at Hornitos, Mariposa Co., for treating the ore of the Quartz Mountain mine, lately bonded by himself and associates from the Brooks estate.

THE Cripple Creek district in Colorado is now credited with a gold yield aggregating $500,000 per month, a very handsome total, representing about the monthly output popularly credited to the Utica mine at Angels in this State.

DURING the thirty-one days of last March the sixty-stamp mill of the Alaska-Mexican Co. only stopped one and a half hours. The stamps weigh 1020 pounds and crushed 6677 tons of very hard quartz through a forty-mesh screen.

TWO REPORTS come from the Silver Star, Esmeralda, Nev., mine sale; one that Senator Wolcott and associates have paid the first $100,000, the other that they backed out and paid nothing. The first mentioned is probably the fact.

FRENCH MINING MEN who have been investigating the matter of deep level mining at the Witwatersrandt, South Africa, give it as their opinion that "the exploitation of Deep Levels will be as profitable as that of upper strata."

COLORADO SPRINGS reports machinery at work there pumping water, evaporating 108,000 gallons every 24 hours, and netting $63 gold therefrom. The report says "the water is lifted through a shaft from bedrock," which is probably correct.

THE Santa Rita Copper and Iron Company's mill at Santa Rita, east of Silver City, N. M., was burned last Saturday night. The machinery was the finest in the Territory, but had been out of use for a number of years. The loss will exceed $100,000.

MESSRS. CHARLTON AND BORNIO, of New Orleans, are about to resume operations at their silver mines, Planchas del Plata, twenty-five miles southeast of Nogales, Arizona. They have perfected title to five large claims and propose beginning with a ten-stamp mill now there to work the ore in sight.

THREE Americans, L. Demond, J. Crismore and H. Jeffrey, have fitted out an expedition at Escalon, Mexico, for the Sierra Madre mountains in search of a famous lost mine, La Fuente, which, according to tradition, contains a vast amount of ore of fabulous richness. The mine was abandoned by the Spaniards over a century ago.

RECENT Colorado mining incorporations are: The Invincible Gold Mining Company, Cripple Creek; capital stock, $500,000; the company owns four claims. The Blackstone Gold Mining Company; capital stock, $1,000,000. The Golden Link Mining, Leasing and Bonding Company; capital stock, $1,000,000; office, Colorado Springs.

AT the old Prietas mill at Minas Prietas (or La Colorado), Sonora, Mexico, two roasting furnaces of sixty tons each daily capacity are being put up, and the building erected on a scale which will admit the location of two more of the same capacity when needed. Those now in course of erection will treat daily 120 tons of Creston ore.

AT a recent meeting of the cabinet of Venezuela, the English concession for a vast tract of the Orinoco country, including the Bahia gold mines and part of the territory claimed by Great Britain, was revoked and a new concession granted to an American company. The latter immediately sent its men to take possession of the concession.

ABOUT sixty acres of beach sand, half way between Cape Flattery and the Ozett river, Wash., have been filed on as mining claims. Messrs. Flint, Downs and Pugh, of Spokane, have patented an invention to separate the gold from the black sand. The water is carried down from streams up the mountain in a flume for a distance of 1170 feet.

THE American Developing and Mining Company has filed its reincorporation papers in Jefferson county, Montana; the incorporation was originally made in February, 1892. Capital stock, $500,000. The trustees are J. H. Henley, A. Burrell, E. L. Whitmore, F. W. Bacorn and J. W. Astley, of Marysville; B. MacDonald, of Helena; and H. Burrell, of Sand Coulee.

THE Blossom mine, in the Cargo Muchacho district, has resumed work. The property belongs to San Francisco and Los Angeles men, and has been equipped with a ten-stamp mill and other necessary machinery, but has been idle for a long time on account of disagreement between its owners. The trouble is now reported settled and the mine will again be started up.

AN asbestos "boom" is reported from Quebec; the mines at Coleraine and Thetford, which have been mostly closed up, are resuming activity. The Bell Company is putting in three new machines for crushing the ore and separating the fiber from the rock, and the Jeffrey mine has been bought for $150,000 by a company which is building a factory for making asbestos tissue, and weaving it into cloth.

THE Oak Island Treasure Co. is among the romances of mining. It was formed to dig up the treasure supposed to have been concealed in Oak Island, Mahone Bay, N. S., by Captain Kidd. About $10,000 was spent last year in excavating at a point where the mysterious tunnel exists, the mouth of which is closed at all times, except during low tides. The company is getting a 30-H. P. engine ready to renew work.

A DEAL is reported on hand between the La Grange Hydraulic Mining Company and Mosten and Gallisen for 1800 acres of placer ground, or gravel, located between the Trinity river and the south fork of Trinity, heretofore undeveloped for want of capital. The price asked is $100,000, and the purchasers will have to build a 20-mile ditch at a cost of $75,000. The La Grange Company has sent two experts to report.

THE Anaconda Mining Company has recorded at Butte a certificate of diminution of its capital stock from $25,000,000 to $1,000,000, in accordance with a decision arrived at by the trustees at their recent meeting. The certificate states that the entire capital stock of the company, 1,000,000 shares, was represented at the meeting and all voted in favor of the proposition to diminish the stock to $1,000,000 and 40,000 shares.

SOME months ago it was noted in this column that the tailings at the Northern Belle, Candelaria, Nev., had been bought by a company who proposed to work them by a new method. Numerous inquiries have been received asking for a description of the method. So far the PRESS has been unable to procure a description of the process. The company has recently secured the tailings of the Eureka and Morgan mills, near Virginia, Nev. No plant has as yet been erected for reduction; our Nevada correspondents write that "the process is not known and is covered by nearly 100 patents."

AT Cripple Creek, Colorado, last Tuesday, in the miners' rock-drilling contests, the principal event was a double match, in which nearly twenty teams were entered and for which $1000 in purses were offered. The first prize, $500, was won by T. O'Neil and H. McMullen of Cripple Creek, who drilled 33⅞ inches in ten minutes. Davy and Fallow of Butte, Mont., took second prize, $250, drilling 33¼ inches.

FRANKLIN LEONARD, president of the Comstock Tunnel Company, has returned to New York and will recommend to the directors that the Comstock Tunnel Company pay half the expense of exploring the Brunswick lode upward from the 1300-foot level, and that branch tunnels be run to tap the American Flat and Sierra City districts from points reached by the south lateral branch of the main tunnel.

DR. MOHN of Los Angeles recently had J. Culley arrested, alleging embezzlement. Mohn engaged Culley to examine some mines in Sonora, Mexico, giving him $150 for expenses. On his return he reported the mines were not as represented. Mohn wanted the $150 back, but Culley claimed that was for his expenses, and refused to refund. When the case came up for trial he proved his claim and was promptly discharged.

THE assayer of the Boise, Idaho, assay office reports for the fiscal year ending June 30th the total receipts of the office were $1,225,101. The receipts for the previous fiscal year amounted to $801,138.33, showing an increase in favor of the past year of $424,962.67. The receipts for the year just closed were the largest in the history of the office. A bar of bullion was received from the Virtue mine, at Baker City, July 3, valued at $25,592.07. The bullion is worth $19.46 per ounce.

THE Lum Gray group of mines near Ehrenberg, Arizona, have been bonded to A. M. Wells. The new owners will construct a railway from the Colorado river to the mines, a distance of twenty-three miles in an air-line. The cost of construction will be $1200 per mile. The mill will be constructed some fifteen miles above Ehrenberg, on the river, and wood and water (the latter in tanks) for use at the mines will be transported by rail. Four tramways will be constructed.

AT the Brown Bear mine, Deadwood, Trinity Co., Sup't. Dobler pays 40 men $2.50 per day; they pay $20 per month for board. The others employed are lessees who work on halves. In the fifteen-stamp mill ten run continually for the company and five for the lessees. Lambert and Grayson, the former owners, took out nearly $600,000 and then sold the mine for $11,000. It still pays very well. Considerable prospecting is being done, there being over ten miles of tunnels in the mountain.

ELECTRICIAN E. M. TALBOT of the Anaconda Electric Light and Power Company was instantly killed last Sunday at the power-house, two miles from Anaconda, Montana. A pulley on a shaft burst, and a fragment struck Talbot on the head, fracturing his skull. He had been at the operating lever, and left it for a moment, and while he was away, the machinery got away and was whirling at a terrific rate when he entered the door. Talbot ran to the lever; but as he reached it, the pulley burst, the iron struck him and he fell dead. The remains will be shipped to Pomona, Cal., for interment.

D. GOLDBAUM of Ensenada has sold his half interest in the San Fernando copper mine, Lower California, to E. C. Humphreys, representative of the Woods Investment Company of Victor, Col. A stock company has been organized to develop the San Fernando and other properties in Lower California, to be known as the San Fernando Mining and Smelting Company. The other mines owned by the company are the Altar, Delfino, Zahara and San Mateo, situated in the San Isidro and San Antonio districts, about fifty miles south of Ensenada. The San Fernando mine, which is below San Quintin, is a copper producer.

JANUARY 18, 1837, standard silver coin of the United States was made legal tender for any amount. February 21, 1853, half-dollars were made legal tender for only $5. February 23, 1873, trade dollars were made legal tender, but on the 22d of July, 1877, they ceased to be such. February 28, 1878, silver dollars of the weight of 412½ grains were made legal tender for all debts. June 2, 1879, an act was passed declaring that silver coins of less value than one dollar should be legal tender to the extent of $10 only. These two acts are still in force. Five, three and one cent pieces are legal tender to the amount of 25 cents.

THERE will be no mining exposition in Denver in '96, nor early in '97, so far as any present arrangements are concerned. The managers claimed subscriptions amounting to about $300,000, but when they published the list last week it was but $75,000. Of this amount D. H. Moffat, the largest stockholder in the water company, and president of the First National Bank, had subscribed $50,000, which he withdrew. As this left but $25,000, there was no hopes of raising the $500,000 necessary to start the show, and about $2,000,000 to carry it through, so it has been abandoned.

SUPERINTENDENT KERVIN of the Gould & Curry and Best & Belcher mines has taken charge of the new prospecting operations on the Brunswick lode. Two inclines will be run in the ground recently purchased by the combination of Comstock companies. These inclines will be put down in chimneys that show fair low-grade ore at the surface. It has been thought better to start in ore and follow it down—thus keeping track of it—than to make an upraise from the Sutro tunnel level, nearly 2000 feet below. It will probably be more satisfactory to all concerned to follow the ore down than to work by guess from below. When a bonanza is found it will be an easy matter to tap it from below.

THE Croydon Quartz Crushing Company, of Queensland, reports the erection of the "largest cyanide plant in the Australian colonies," at a cost of close upon £6500. "Up to date," the report states, "16,182 tons of tailings have been treated, the bullion from which was valued at £13,244 18s 10d, clear of bank charges. From this a dividend equal to 10 per cent has been declared, and regular monthly dividends are anticipated for the present. The total cost of extraction, including the 10 per cent depreciation written off, amounted to 7s 6d per ton of tailings treated. The value realized was 16s 6d, on which 1s 4d per ton was paid as royalty, thus leaving a profit of 7s 8d per ton; which would be raised to 9s a ton if the royalty could be got rid of." The amount paid as royalty to the Australian Gold Recovery Company for the use of the cyanide patents is £1066 18s 11d.

Buying and Selling Mines.

TO THE EDITOR:—I observe in your issue of June 29th a rejoinder by "Miner Too" to my communication of the previous week, on the subject of "Buying and Selling Mines." He takes exception to my statement that parties to whom mines are offered by men or syndicates with ample capital to buy them themselves, ask why they should be allowed to go abroad for a market, if so good. "Miner Too" thinks the standing and responsibility of such a syndicate should inspire confidence, and the proposed investor would rely upon such as a guarantee of the merit of the mines offered. My experience does not bear out that theory, and I have had as much as almost any one who has undertaken the sale of mines abroad, and in our own country, and I have found that more business could be done individually, under direct authority of the owner of the property, than through a syndicate or capitalists, as the very fact of its being in such hands implied a heavy commission, which is of course added to the price of the property, and that the purchaser well knows. As a proof of the fact of the soundness of my opinion that no syndicate can, or ever has, succeeded as a business in selling mining property, I ask "Miner Too" to name a single instance where any one of dozens of similar associations of capitalists and "respectable gentlemen" have ever sold any important properties here, or elsewhere. It will be found that all sales have been made by an individual representing the owner, or under a bond from the owner. If, however, this proposed syndicate of highly respectable gentlemen *can* inspire that confidence necessary to bring out investors in our mines, I say for one, for Heaven's sake let us see them sail in, and bring us "shekels" galore. I shall be only too glad to be proven wrong and "don't know a —— thing about it." We will wait and see how the thing pans out, and if I am wrong, will acknowledge it like a man.

"Miner Too" resents the proposition of the advance of capital to develop dormant properties, build mills, do all the work, that the owner never will and never can, and calls a fair share of the result "robbery." It is a harsh term for setting a miner on his feet, and giving value to his property, which he never could realize a red cent from otherwise, and grows old and gray waiting for some green man to come along and buy, what? a hole in the ground that shows nothing.

Which is better, a realization of a positive value on the result of the development, even if but half, or letting the claim lie dormant, from which by the owner's own efforts there never will be a day's work done? On the principle that half a loaf is better than none, is it not better to give away half that is not worth a dollar, to make the other half worth, may be, thousands? It does not require much profound thinking to come to a conclusion on that proposition. In conclusion, I want to remind "Miner Too" not to forget to call my attention to any of the heavy sales that are to follow the organization of this syndicate, for I shall be greatly pleased to hear of such, and will "whooray" louder than any man in the State, and with a "bully for you" as a tiger. MINER.

July 10, '95.

An Accomplished Woman Miner.

TO THE EDITOR:—I have spent the month of June in the Humboldt mountains, looking over good gold prospects. The main claim is called the "Lost mine." It was opened thirty-one years ago, prior to the advent of the railroad. A shaft was sunk on the vein about twenty-five feet, it averaging about $75 per ton gold. At that time it would not pay, owing to the excessive cost of mining material and labor. During the past four years persistent searches were made for the mine, but each time were abandoned, until this spring when a cultured woman of the new age appeared in the person of Mrs. Ida M. Strohridge, in company with a young man lately employed on her father's ranch near Humboldt. She is a most remarkably bright woman, and will climb a precipitous cliff where the average man would not dare to venture. In addition to mining she looks after the business of her father's cattle ranch, and is quite a sportswoman and would probably carry off the first prize in a shooting tournament, as she brings down her game every time. She wears a handsome brown denim costume, which she dons in climbing the very steep and rugged cliffs of the Humboldt mountains. She has located five claims on the lode, laid out a new camp and named it after her father, "Meacham," and reorganized the district anew as the "Humboldt;" she has four men to work and is superintending operations herself. She has also located the water and springs flowing over the claims, which are nine miles east of the Central Pacific Railroad, at the Humboldt House. Such is the New Woman.

The Lost mine can be traced a distance of 2200 feet along the vein, from twelve to eighteen inches wide and crops out from six to twenty-four feet in height. It is a white and rose-colored quartz, which, when broken, shows the free gold quite plainly, and assays range from $6.50 to $340 per ton; the average is about $85 per ton gold. Mrs. Strohridge is now engaged running a tunnel under the shaft where the vein is showing up finely, and if the present appearance is maintained the New Woman will in due time be reckoned as a millionairess, and all by her indomitable will and perseverance. She is now sacking ores for shipment. TRAVELER.

Carson, Nevada, July 3, '95.

Lake Superior Mining Machinery.

TO THE EDITOR:—The wonderful deep mining of the Lake Superior native copper mines requires very powerful machinery for the safe and successful hoisting of the skips and cages laden with the miners and the heavy copper-bearing rock.

The construction of this machinery deeply interests those who work in the mines and the capitalist who is financially interested, therefore it is not to be wondered at that any innovation or deviation from an accepted standard is criticized by the mechanical mining man and is a source of anxiety to the miner who risks his life the moment he steps into the cage to descend or ascend the shafts at a speed nearly that of a first-class passenger train on surface.

The report that the Tamarack Mining Co.'s new hoisting engine and drum at the No. 3 shaft did not work satisfactory affected the shares of that mine in the stock market. That there was apparent cause for such a report was substantiated by the necessity of the presence of Mining Engineer E. F. Neukom, the designer for the contractors E. P. Allis & Co. of Milwaukee, before the machinery, which cost over $100,000, was recommended for acceptance to headquarters by Supt. W. E. Parnall.

Mining Engineer Neukom was clothed with authority to make a rigid and fair test of the engines without being hampered in any way by the mine officials. His three days' test resulted in the machinery performing all that was required of it as near as any engine can do with 90 pounds of steam pressure, whereas the contract specifies 100 pounds pressure.

For three days the maximum load was raised and lowered without a balance weight attached. The engine started easily and free at any point in the shaft; it made no difference if the load was in the bottom or near the surface. The engine, in performing its regular work, will never be called on to do as much work as was performed during the three days' test, which was made under the very worst conditions.

The capacity of the engines is nearly 2000 horse power. The double cone drum is the new feature. The drum carries 7000 feet of inch and three-eighth steel cable on each side, or 14,000 feet total. The machinery will ultimately be required to hoist three tons, besides the weight of cable, from a depth of 7000 feet at a speed of from 2500 to 3000 feet per minute. The drum is the largest in the world, being 36 feet 6 inches in diameter, weight 340,000 pounds, diameter of shaft 28 feet 6 inches, length 33 feet 6 inches. The shaft crank and center hub weigh 62 tons.

The engines began their routine work this week, and the engineers who are in charge, as well as the mine officials, are elated over the efficiency and smoothness of the running of the engines that are now hoisting from the deepest mine in the world.

Houghton, Mich., July 2, 1895. A. F. ISLER.

WAR is being waged in England against the use of the word scientist. The Duke of Argyll, Sir John Lubbock, Lord Rayleigh, Lord Kelvin and Professor Huxley unreservedly condemn the word; Sir John Lubbock proposes philosopher instead; Lords Rayleigh and Kelvin prefer naturalist. Professor Huxley thinks that scientist must be about as pleasing as electrocution to any one who respects the English language. Grant Allen, while disapproving of the word, thinks it is pedantry to object to a new word when it is used by a majority of the persons; after the camels of altruism and sociology, scientist is comparatively a gnat. Alfred Wallace alone is not disturbed by the word; he describes it as useful, and argues that, since we have biologist, geologist, chemist, physicist and specialist, we might as well use scientist, and he further asks, "What is there to use instead?" *Science Gossip* says the word was first invented and used by Whewell in his "Philosophy of the Inductive Sciences."

SIR ROBERT BAU says that, going at the rate of the electric telegraph—that is, 186,000 miles a second—it would take seventy-eight years to telegraph a message to the most distant telescopic stars, but the camera has revealed stars far more distant than these, some of which, if a message had been sent in the year A. D. 1—that is to say, 1894 years ago—the message would only just have reached some of them, and would be still on the way to others, going at the rate of 186,000 miles a second.

Calcium Carbide.

At the last meeting of the California Academy of Sciences, a reading and exhibition of acetylene gas derived from calcium carbide was given by E. C. Jones, assistant engineer of the Pacific Gas and Improvement Company. He said the secret of combining calcium and carbon was divulged by the high temperature of the electric arc and was purely accidental.

In 1893 L. T. Willson of Spray, North Carolina, devised a process for reclaiming metallic aluminum by means of an electric furnace, but was debarred from carrying on his work by an injunction obtained by another company having similar patents. He then turned his attention to the utilization of his furnace for the purpose of obtaining the metal calcium by reducing lime with finely divided charcoal. He found that at the temperature of the electric arc an inter-action took place, which resulted in the evolution of carbon monoxide and light behind a fused mass which solidified to a very hard semi-crystalline body. This mass was thrown into water to cool it, as it was apparently useless material, but an instant evolution of large quantities of gas attracted attention. It was found to be calcium carbide, which is composed of forty parts by weight of calcium combined with twenty-four parts of weight of carbon. On adding water to the carbide a double decomposition takes place. The oxygen of the water combines with the calcium, forming lime again, while the hydrogen unites with the carbon of the carbide to form acetylene gas. Mr. Willson gave an estimate of the cost of making carbide, from which the gas is manufactured, based on his experience, at about $15 per ton. It appears, however, that Mr. Willson had underestimated the cost of the carbide, or else the dealers are realizing excessive profits, for an aluminum company in Neuhausen, Switzerland, is manufacturing calcium carbide and offering it for sale at about $110 per ton.

The cheap production of acetylene opens a new and fascinating field for the student of chemistry, for acetylene is regarded as one of the most important intermediate bodies in the synthesis of organic compounds from these elements. By heating it in a sealed tube, it is converted into benzine and styroline and alcohol, and all of the cyanides may be synthesized from it—in fact, the scope for research opened by this discovery is so great that the effect on organic chemistry will be revolutionary.

Suing a Smelter.

A mining suit involving $450,000 has been begun in the District Court by A. M. Hendry against the Pueblo Smelting and Refining Company for the value of ore claimed to have been taken by the smelting company from a mine belonging to Hendry, and converted to its own use.

Five years ago Hendry went to the New Placer mining district, Santa Fe county, N. M., purchased the Anaconda mining claim, paying therefor $25,000, and sunk a shaft. Adjoining the Anaconda is the Lincoln Lucky mine. The ore, which is a sulphide, lies in a pipe and runs from the Lincoln Lucky into the Anaconda. Hendry claims that the Lincoln Lucky people followed the vein beyond their lines into the Anaconda territory and extracted 4500 tons of ore, which he estimates worth $100 per ton. The smelter returns show that over 4000 tons were shipped to the smelter. The purchasing agent of the smelting company, who is also interested in the Lincoln Lucky, and one or more of the latter company, it is said, had full notice that the ore was claimed by Hendry at the time it was shipped to the smelter, and on that ground it is claimed that the smelting company is liable, as they must have known they were buying ore from the Anaconda. Hendry also notified them formally, it is said, of his ownership of the mine.

Hendry has been in litigation over his mine ever since the purchase, and it is now in the Santa Fe courts. The Lincoln Lucky owners claimed that the location had been made on a Spanish grant and was therefore void, but this grant was set aside by the United States Government, leaving Hendry's title, he claims, intact. In the litigation which has just commenced the smelting company will probably dispute Hendry's ownership of the mine and set up apex rights and surface locations.

THE right of a man to defend himself on his own premises has been vindicated by the United States Supreme Court in an Arkansas case. A man with two others came on the premises of his brother-in-law to seize a cow. He drew a revolver to intimidate the owner of the animal, and was thereupon struck and killed. The court at the trial held that this killing was not justifiable, as the man must retreat inside his dwelling-house before he had a right to fire in self-defense. The Supreme Court overrules this decision. It holds that a man on his own premises is where he has a right to be. If he did not provoke an assault, and believed his life in danger, he was not obliged to retreat, and was justified in meeting force with force. This is common-sense doctrine, and it is gratifying to know that the highest court has affirmed it to be good law.

Statistics of the Railways of the United States for the Year Ending June 30th.

The seventh statistical report of the Interstate Commerce Commission is received, of which the following isan abstract. In the introduction of the report especial attention is called to the peculiar conditions affecting the operation of railways during the year covered by the report. First, the report covers the last four months of the Columbian Exposition, during which time there was an increased passenger traffic. Second, it covers a period of widespread and unprecedented business depression. Third, on June 30, 1894, 192 roads, operating upwards of 42,000 miles of line, and representing about one-fourth of the total railway capitalization, were in the hands of receivers. The effect of these conditions is apparent in nearly all of the figures presented.

Mileage.—The total railway mileage in the United States on June 30, 1894, was 178,708.55, an increase during the year of 2,247.48 miles. The increase during the previous year was 4,897.55 miles. The percentage of increase in 1894 was less than for any preceding year for which reports have been made to the Commission, and it is not probable that the year ending June 30, 1895, will show much improvement. The State of Pennsylvania shows an increase of 300.20 miles; Florida 234.82, North Dakota 195.54, Ohio 184.02, Georgia 162.71, Maine 125.60, Missouri 120.51, West Virginia 117.56, and Minnesota 116.49. The States of Kansas, Maryland, Massachusetts, Nevada, New Hampshire, North Carolina, Vermont, Virginia, and the Territory of Arizona, show slight decreases in mileage, due to remeasurements and abandonment of lines, aggregating 153.72 miles. The number of roads abandoned was 16. The total mileage of all tracks was 233,533.67 miles, which includes 10,499.30 miles of second track, 953.16 miles of third track, 710.99 miles of fourth track and 42,661.67 miles of yard track and sidings.

Classification of Railways.—The total number of railway corporations on June 30, 1894, was 1924, an increase during the year of twenty-two. Of this number 745 were independent operating companies and 945 maintained separate operating accounts. The number of companies maintaining financial accounts only was 804, of which 334 were operated under lease for a fixed money rental, and 190 for a contingent money reutal; 243 were controlled through the ownership of stock by the operating company; the remaining 37 returned no information as to the form of control. The number of roads not in operation was 77, of which 60 were independent roads; ten were subsidiary roads, parts of systems, and seven were private roads. In addition to the roads already referred to there were 98 private roads operated in connection with logging, milling and mining industries. The movement of consolidation during the year on the basis of mileage involved has been greater than for the year previous; fifteen roads, representing 1734.64 miles, have been merged; twenty-two roads, representing 2351.99 miles, have been reorganized, and fourteen roads, representing 1590.34 miles, have been consolidated. A classification of railways on the basis of operated mileage shows that 44 roads, each with a mileage of over 1000 miles, operate 100,547.29 miles of line, or 56.30 per cent of the total mileage of the country; twenty-three roads, each with a mileage of over 600 and less than 1000 miles, operate 17,918.35 miles of line, or 10.3 per cent of the total mileage; twenty-three roads, each with a mileage of 400 and less than 600 miles, operate 11,724 miles of line, or 6.57 per cent of the total mileage; forty-two roads, with a mileage of over 250 and less than 400 miles, operate 13,508.82 miles of line, or 7.56 per cent of the total mileage; and 907 roads, each with a mileage of less than 250 miles, operate the remainder of the mileage, 34,910.26 miles, or 19.54 per cent of the total mileage. From this it will be seen that 90 roads, representing the first three classes, operate 72.90 per cent of the entire mileage of the country.

Equipment.—On June 30, 1894, the total number of locomotives was 35,492, an increase during the year of 704. Of these, 9893 were passenger locomotives; 20,000 were freight locomotives; 5089 were switching locomotives; and 513 were unclassified. The total number of cars reported was 1,278,078. Of these, 33,018 were in passenger service; 1,205,169 were in freight service; and 39,891 were caboose, derrick, gravel, officers, pay, and other cars in the company's service. These figures do not include cars owned by shippers or private individuals. The increase in the number of cars during the year was 4132, as against an increase of 58,854 during the previous year. This falling off in the ratio of increase is due to the fact that the railways have during the year destroyed a large number of old, wornout cars. The number of passengers carried per passenger locomotive was 62,639, and the passenger miles per passenger locomotive were 1,444,400. The number of tons carried per freight locomotive was 31,909, and the ton miles per freight locomotive were 4,016,755. With the exception of the item of passengers carried, these figures show a decrease in the efficiency of locomotives. The number of passenger cars per 1,000,000 passengers was 53, and the number of freight cars per 1,000,000 tons of freight was 1888. During the year 1579 locomotives and 30,386 cars were fitted with train breaks, and 1197 locomotives and 34,186 cars were fitted with automatic couplers. While the gain in the use of both these safety appliances is largely in excess of the increase of equipment during that year, it cannot be considered as showing a marked tendency toward compliance with the law, as 74.80 per cent of the total equipment is still without train brakes and 72.77 per cent without automatic couplers. The law requires that all equipment shall be supplied with these safety appliances before January, 1898, while it requires that all cars shall be provided with grab irons or hand holds and drawbars of a standard height by July 1, 1895.

Employees.—The total number of railway employees on June 30, 1894, was 779,608, a decrease, as compared with the number on June 30, 1893, of 93,994, or 10.76 per cent. This is a smaller number employed than in any year since 1890. This decrease is, of course, due to the heavy falling off in traffic and the endeavor of the railways to economize. On the basis of four persons being dependent on each wage earner, it shows that over one-third of a million of people have been deprived of their regular means of support. The class of employees showing the greatest decrease are trackmen, the decrease of this class being 29,443, or 16.34 per cent; the next largest decrease is 19,890, or 18.91 per cent, for laborers and other unclassified employees. The decrease in employees assigned to general administration was 3635, or 10.27 per cent; in employees assigned to maintenance of way and structures 40,841, or 15.94 per cent; in employees assigned to maintenance of equipment 23,490, or 13.38 per cent, and in employees assigned to conducting transportation 32,023, or 8.05 per cent. Localized, the largest decrease is in Group VI, 26,168, or 15.36 per cent, and Group III comes second with a decrease of 20,680, or 14.99 per cent. A new feature in this report is a table giving a comparative statement of the average daily compensation of the various classes of railway employees for 1892, 1893 and 1894. For 1894 the average daily compensation was for general officers $9.71, other officers $5.75, general office clerks $2.34, station agents $1.75, other station men $1.63, enginemen $3.61, firemen $2.03, conductors $3.04, other trainmen $1.89; machinists $2.21, carpenters $2.02, other shopmen $1.69, section foremen $1.71, other trackmen $1.18, switchmen, flagmen and watchmen $1.75, telegraph operators and dispatchers $1.93, and employees of floatiug equipment $1.97.

Capitalization and Valuation of Railway Property.—The total amount of reported railway capital on June 30, 1894, was $10,796,473,813, or $62,951 per mile of line. This is an increase in the amount outstanding during the year of $290,238,403. The amount of capital stock was $4,834,075,659, of which $4,103,584,166 was common stock and $730,491,493 was preferred stock. The funded debt was $5,356,583,019, classified as follows: Bonds, $4,593,931,754; miscellaneous obligations, $456,277,380; income bonds, $242,403,681, and equipment trust obligations, $63,970,204. The amount of current liabilities was $605,815,135. The amount of railway securities held by the railways as an investment was $1,544,058,670, a decrease during the year of $18,963,563.

The amount of stock paying no dividend was $3,066,150,094, or 63.43 per cent of the total amount. Of the stock paying dividends, 4.31 per cent of the total stock paid from 4 to 5 per cent; 10.12 per cent paid from 5 to 6 per cent; 5.12 per cent paid from 6 to 7 per cent; and 5.42 per cent paid from 7 to 8 per cent. The total amount of dividends was $95,575,976, or an average rate on the dividend-paying stock of 5.41 per cent. The amount of bonds paying no interest was $650,573,789, or 14.17 per cent. The amount of miscellaneous obligations paying no interest was $53,426,264, or 11.71 per cent, and the amount of income bonds paying no interest was $210,757,554, or 86.94 per cent.

Public Service.—The number of passengers carried was 619,688,199—an increase over the previous year of 26,127,587. This increase is almost wholly in Groups III and VI, and was occasioned by the World's Fair travel. The passenger mileage was 14,289,445,893. The average number of passengers in a train was 44, and the average distance traveled by each passenger was 23.06 miles. The passenger mileage per mile of line, which indicates the density of passenger traffic, was 81,333—a slight decrease as compared with the previous report. There was a large decrease in freight traffic, the number of tons carried being 638,186,553, as against 745,119,482 in 1893—a decrease of 106,932,929 tons. The ton mileage was 80,335,104,702—a decrease of 13,253,007,131 from the previous year—and the ton miles per mile of line decreased from 551,232 in 1893 to 457,252 in 1894—a decrease in density of traffic of 93,980 ton miles. The average number of tons in a train was 179.80—a decrease of 4.17 tons, showing a decrease of economy in the use of freight equipment. The average haul of one ton was 125.88 miles.

Earnings and Expenses.—The gross earnings of the railways for the year ending June 30, 1894, were $1,073,361,797, a decrease as compared with the previous year of $147,390,077, or 12.07 per cent. Passenger revenue decreased $16,142,258, or 5.35 per cent, and the revenue from freight traffic decreased $129,562,948, or 15.63 per cent. The amount of operating expenses was $731,414,322, a decrease of $96,506,977, or 11.66 per cent. The largest per cent of decrease was in the operating expenses assigned to maintenance of way and structures and to maintenance of equipment, which show, respectively, a decrease of 15.12 and 17.52 per cent. The net earnings were $341,947,475, a decrease of $50,883,100 as compared with the previous year. The income derived from sources outside of operations was $142,816,805. The amount of fixed charges and other deductions from income was $429,008,310, leaving a net income of $55,755,970 available for dividends, a decrease as compared with the previous year of nearly 50 per cent. The amount of dividends paid was $95,575,976, a decrease of only $5,353,909 from the amount paid the previous year. The fact that nearly the normal amount of dividends was paid notwithstanding the great decrease in income available for them, and that the payment of the amount stated entailed a deficit from the operations of the year of $45,912,044, is suggestive. The revenue derived from the carrying of passengers was $285,349,558, or 26.58 per cent of gross earnings, and the revenue derived from freight traffic was $699,490,913, or 65.16 per cent of gross earnings.

Accidents.—During the year 1823 railway employes were killed and 23,422 were injured, as compared with 2727 killed and 31,729 injured in 1893. This marked decrease in casuality is in part due to the decrease in the uumber of men employed, and the decrease in the volume of business handled. The increased use of automatic appliances on railway equipmeut also may have rendered railway employment less dangerous and it may be that the grade of efficiency of employes has been raised.

The number of passengers killed was 324, an increase of 25, and the number injured was 3304, a decrease of 195. Of the total number of fatal casualties to railway employes, 251 were due to coupling and uncoupling cars, 439 to falling from trains and engines, 50 to overhead obstructions, 145 to collisions, 108 to derailments, aud the balance to various other causes not easily classified. To show the ratio of casualty, it may be stated that one employe was killed out of every 428 in service, and one injured out of every 33 employed. The trainmen perform the most dangerous service, one out of every 156 employed having been killed and one out of every 12 having been injured.

The ratio of casualty to passengers is in striking contrast to that of railway employes, one passenger having been killed out of each 1,912,628 carried, or for each 44,103,228 miles traveled, and one injured out of each 204,248 carried, or for each 4,709,771 miles traveled. A distribution of accidents to the territorial groups exhibits the diversity in the relative safety of railway employment and of railway travel in the different sections of the country.

Conclusion.—In concluding the report the statistician renews the recommendatious made in previous reports in regard to the desirability of requiring annual reports from express companies, corporations, companies and persons owning rolling stock used in interstate commerce; corporations, compauies and persons owning depot property, stock yards, and elevators used by interstate carriers, and from carriers by water that compete with railways for traffic. Refereuce is also made to the question of requiring railways to report freight earnings by commodities. On account of the present depressed financial condition of railways, it has been decided to let this matter rest another year, although there is no question as to the desirability of such reports.

In working hard materials with diamouds set in metal there has always been a difficulty in preventing the stone from being ripped out by the strain. An effective method of doing this has been devised. A little block of steel, suitably notched to receive the diamond, is brought to a red heat, the diamond is inserted, and the block is passed through a small roll. The diamond is thus firmly imbedded in the block, though projecting slightly beyond its surface, and defies the strain of the most exacting work.

While conducting a series of tests with a 100-ton testing machine at the Yorkshire College in England, which included the testing of a steel wire rope, Prof. Goodman stated that such ropes were not a modern invention, and that he had recently seen a bronze wire rope one-half inch in diameter and from twenty to thirty feet long, which had been buried in the ruins of Pompeii and which must have been at least 1900 years old.

Red phosphorus combines with chlorate of potash to make an explosion of great violence. The London *Lancet* thiuks that if this fact of chemistry had been more generally known it might have saved the disagreeable consequences which recently followed when a man who had not studied chemistry put his safety matches into the same pocket with his throat lozenges.

A man standing at the equator is sweeping through space at the velocity of 509 yards per second.

Fluming Ore in Alaska.

To THE EDITOR:—Perhaps a word from this distant part of our common country might not be uninteresting to your readers, and possibly the matter upon which I wish to write may be new to some of them.

We have put into operation here a method of ore transportatiou which, where conditions are favorable, might be employed elsewhere to very great advantage and economy. These conditions are plenty of water at mine and a fall of not less than one-half inch to the foot to the point to which ore is to be conveyed.

Our mine is situated one mile from mill; elevation above mill over 600 feet. The proposition that confronted us was how to convey the ore to mill at least cost, both as to construction and operation of means employed. All the usual methods were out of our reach either because of excessive first cost or subsequent operation. We had abundance of water, and the scheme of trausportation by water being suggested, we experimented, and decided to put in an ordinary box flume for the purpose. I may say here that our experiments first made were with V boxes. These were found not to work well. The size of flume decided upon was six inches wide by eight inches high, inside measurements, made of two-inch rough lumber, the bottom of boxes being ten inches wide and nailed upon the edges of sides eight inches wide. The fall given our boxes is not less than twelve inches to twelve feet.

Our work since completion and operation has shown that a much smaller box would have been ample for a quantity much in excess of our present requirement, say twenty tons per day. With one inch or one and a quarter inches of water in depth in our boxes we send down to mill thirty tons in ten hours, and I am satisfied that we could, with a little more water, convey twenty tons or more per hour. The boxes are laid end to end and short turns avoided. The lumber was not even planed, and in a week's time no one could have told whether they had ever been surfaced or not. It is too soon after beginning work to say just how much the wear will be, but so far, where the fall is not over one inch to the foot, the wear is not much, but it increases rapidly as the boxes become steeper. I do not think the wear will make the transportation of ore cost us to exceed five cents per ton. There is absolutely no expense except the wear of boxes. I believe that by putting sheet iron on bottoms of boxes and using plenty of water the same results could be obtained with a fall of one-half inch to the foot.

Of course our rock-breaker is located at the mine—where all rock-breakers ought to be—run by water power, the same water afterward carrying the ore to mill. We have a Gates' breaker, so that our ore is broken into small pieces and as nearly cubical as possible. The entire cost of this flume has not exceeded $1200.

As complementary to this method of ore transportation, which I may say is as feasible for long as for short distances, I will briefly indicate how the ore is handled at the mill. We have two water-tight ore bins, with chutes leading into hoppers of self-feeders, these chutes being fitted with plain wooden caps over ends, made water-tight with rubber gasket, etc. After one bin is filled and drained off we begin on that ore, and before that is exhausted our other bin can be filled.

During the process of filling the water runs off through an overflow box, and by this overflow all the debris, such as chips, fuse, candle droppings, etc., besides much valueless slum—with us principally graphite—are carried off. Thus we have a much cleaner ore to run through our batteries and over our concentrators, and can do more and better work in both as a consequence.

If any of your readers will describe a better or more economical scheme I should be pleased to have them do so. Any questions from mining men will be cheerfully answered. N. S. TROWBRIDGE,

Sup't Bald Eagle M. Co.

Sandford Cove, Alaska, June 24, '95.

Colorado's Mine Commission.

The State Commission of Mines has got fairly into harness, says the Denver *Republican*, and the defects in the Newman act creating the office are becoming apparent. Owing to the courtesy of mine owners, the department is being enabled to collect statistics, but only through courtesy. Where an obstinate section is run up against and facts are withheld from the deputy inspectors, down goes a blank and a complete report is rendered entirely impossible. Under the old act there was a Metalliferous Mines Inspector, and the new act contains precisely the same provision. This end of the act is working all right, and the commissioner already has done a lot of good work. He has closed down several dangerous mines, caused a number of others to timber, ventilate and otherwise improve their properties, and made over 200 suggestions to mine operators, which will be enforced. Apart from this, the bill is proving to be the humbug that it was at first declared it would be. The collection of specimens which it was promised the State would be able to get together is slow in materializing. Commissioner Lee has secured some, but they are commonplace. There are eighty-seven professional collectors in this State, every one of whom is willing to pay a high price for valuable specimens. The idea that there would be a procession of express wagons going to the capitol every day loaded with rich specimens has gone glimmering. "It takes hard money to get such specimens as I would like," Commissioner Lee says, and related an instauce.

"I ran across one that I knew would be of value to the State and tried to buy it. I offered the miner $9 a pound for it, which would have come to about $13. He said he would go and get it weighed, and while he was weighing it a collector offered him $25. He then decided he had a good thing and put it in a window for offers. The next was $75 flat, and the last I heard of it was he had been offered $200 and refused to take it."

The commissioner is sure he will be able to get many specimens from personal friends, but the predictions that the collection would not be an important one will unquestionably be borne out for just such reasons as the commissioner has stated,

When a workman is killed in a coal mine, it is the duty of the inspector, under the law, to at once visit the mine, note the cause of the accident, make a report and declare the man dead. Beyond this the inspector has uo authority whatever. The consequence of this is that it costs Colorado from $5 to $70 to declare dead every workman killed in a mine in the State, depending on how many miles at ten cents a mile the inspector has to travel. This condition of things led to a good deal of discussion in the last Legislature, but there is in the new Metalliferous Mines bill an exactly similar clause, commanding the inspectors to at once go to the scene of each fatal accident, which occasions a loss of time, expense and results in no good whatever that could not be accomplished in the ordinary method of investigating violent deaths, particularly where men are killed from such apparent causes as falling down a shaft.

Coast Industrial Notes.

—Seven ostrich farmers in southern California have sold $90,000 worth of feathers during the last year.

—The Crescent City Lumher Co. has a contract for 100,000 railroad ties for the Alameda and San Joaquin road.

—The Clatsop mill at Astoria, Or., has over 100 men employed. Ninety thousand feet of lumber per day is being sawed.

—On her next trip from San Francisco to Cook's Inlet, Alaska, the hark Theobald will carry a complete coal mining outfit and twenty miners.

—The steamer Washtenaw arrived in San Francisco last Sunday with a cargo of rails from New York for the San Francisco and San Joaquin Valley Railroad.

—The Columbia river salmon pack is reported in the usual state of collapse; still, at the close of the season, the aggregate will prohahly he ahout as in former years.

—The Harhor Commissioners last Thursday gave the contract for supplying the tugs, dredgers and pile-drivers with coal to the Black Diamond Coal Company at $5.30 a long ton.

—The receipts of coal at this port for the first six months of '95 were 658,400 tons; for the corresponding period of '94, 621,000 tons. Coal was never cheaper in California than at present.

—In the city limits of Los Angeles, T. B. Flint has put a well down through the deepest sand that oil has heretofore heen found in, and down to the next sand, ahout 200 feet below, where he found oil of 38° gravity.

—The Waters-Pierce Oil Co. has been operating in Mexico nine years. In the district comprising the west coast of Mexico they sold twenty-four carloads of oil the first year. Last year their sales in the same district aggregated 175 cars.

—In addition to recent extensive improvements, the Government has decided to make additional improvements at the Presidio. Besides erecting thirty-five brick and stone structures, new roads will he laid out. The work will involve an expenditure of over $500,000.

—The Nevada County Electric Power Company will have access to 6000 inches of water. Ahout 1000 M. feet of lumher is now being used in huilding flumes, etc. The two 400-horse power dynamos will be shipped on the 15th. The company expects to have everything in successful operation by the middle of September.

—The Sonoma, Mendocino and Humholdt Ry. Co. has incorporated; capital stock $6,250,000, of which $250,000 is subscribed. The proposition is to build from Healdsburg to Eureka, with a branch from Fort Bragg to the Round Valley coal fields. Chicago and New York men are said to he interested, and surveyors are in the field.

—The deal for the transfer of the Northern Pacific railroad to the Great Northern has been definitely declared off. The remarkable improvement in the net earnings of the Northern Pacific made it practically impossihle to carry out the plan to turn the road over to the Hill interests. An official of the Northern Pacific says the road has earned $6,000,000, and there was good promise for $7,000,000 for the ensuing year.

—A very large deposit of marhle has heen found in Pima county, Arizona, ahout ten miles from the Southern Pacific Railroad and thirty miles from Tucson, on George Stone's ranch, near the old Blue Jay mine. Cliffs of pure marhle stand hundreds of feet high and thousands of feet long, and apparently without a hreak. This marhle is white, hlack and variegated, is of fine grain and susceptible of a high polish.

—The oldest olive tree in the United States is at the Mission of San Juan Capistrano in San Diego county. The seed of this tree was hrought from Barcelona, Spain, 126 years ago. The purpose of the Franciscan friars in planting olive trees in southern California was to provide food for the priests who came from the olive-growing districts of Europe. This veteran olive tree is fifty feet high, with a trunk five feet in diameter. Since the first planting of olive trees in California the industry has extended so that it to-day embraces 700,000 trees, of which 400,000 were planted in 1893. Six years ago there were only 700 acres of olive groves in California. To-day there are 21,000 acres, 5000 of which are in bearing.

—In ahout a month one of the largest hlasts ever fired in California will be exploded at the Otay dam, where a granite cliff over 100 feet high and several hundred feet long will he removed hy five tons of giant powder. Workmen are sinking a shaft eighty feet deep 100 feet hack from the face of the cliff. At the hottom of the shaft tunnels will be run the required length, the powder planted and fired hy electricity.

—From a source deemed reliahle it is learned that the Cuyamaca and Eastern railroad in San Diego Co. has been secured hy the Southern Pacific. The plans, so far as ascertained, are that the Cuyamaca will he made the terminus of the Southern Pacific in San Diego city, the road traversing the most fertile portions of the county. The point of connection with the Southern Pacific system is not yet known, whether the line will extend southward from Tustin or from Riverside.

—The importance of the China and Japan trade, and the immense amount of money it annually hrings into the country, is shown by the value of the cargo of the last Northern Pacific steamer, the Tacoma. The value of the dutiahle merchandise which passed through Tacoma to its various destinations was $290,084, while the goods consigned to parties in that city, upon which duty will he paid, was $129,875.84. The total value of the cargo upon which duty is collectahle was $419,-959.84.

—A big $30,000 dredger is being finished at Hay & Wrights yard, in Alameda, for use on the San Joaquin levees. The hucket weighs five and a half tons; the flexihle steel cables have each a tensile strength of sixty tons; the hoom on which the bucket swings is 20 inches square, 130 feet long, and was hewn out of one piece of timher. It has a 400-foot swing and will work in 60 feet of water. The dredger is 110 feet over all, 50 feet heam, 10 feet deep. Its capacity is calculated at 4000 yards per day.

—A scow, designed for saving gold from river-bottom sand, left her moorings at the foot of Folsom street on the afternoon of the 11th inst. for work on the American river. The scow is 60 feet in length, 14 feet heam and is fitted with a 20-H. P. stationary engine, one of the Krogh Manufacturing Co.'s No. 2¼ centrifugal dredging pumps, two Gold King amalgamators, manufactured by the Midas Gold Saving Machinery Co., two screens and shakers, pipe, shafting, pulleys, etc. The idea is to pump the sand from the river hottom, run it over the shakers and screens, getting rid of the coarse gravel, and then passing it through the amalgamators. The plant is to he operated hy two men and can handle about 100 tons of material in a shift of 12 hours. The enterprise is in the hands of the Mendota Gravel Mining Co.

—The Tehuantepec railroad is an important factor in isthmusian transportation. Transportation from San Francisco hy fast freight line to New York via Southern Pacific to New Orleans, and thence by water to New York, covering a distance of about 4600 miles, is accomplished in fourteen days. It takes 140 days to cover by sail the distance of 15,420 miles around Cape Horn, 60 days hy steam along a route of 13,000 miles via the Straits of Magellan, 25 days via transcontinental line, fast freight, over a distance of 3300 miles, and only 20 days via the Tehuantepec railroad, a distance of 4280 miles. A comparison in respect to time and distance of all-rail routes with the half rail and half ocean routes via New Orleans at once demonstrates the importance of this new Tehuantepec route as a competitor for a large class of traffic, and suggests why the Southern Pacific and Morgan line via New Orleans have heen ahle to obtain from 75 to 90 per cent of the entire transcontinental traffic and dictate their own terms to competing lines.

—When the Folsom electrical transmission scheme is an assured fact, the American River Land and Lumher Co., of which A. J. Ralston is president, will huild a lumher mill at Folsom, to have a capacity of 20,000 M. feet annually, and be run hy electricity. The logs are to he cut on the upper Georgetown divide, fourteen miles northeast of Placerville. They are to he carried thence hy a logging railroad ten miles long to the south fork of the American river, where they will he rolled off the cars into a log chute 3000 feet long, with a fall of 1100 feet, down to the river. This chute is large enough to take logs seven feet in diameter. Thence they drop into a log basin, the back water from the dam, forty feet high, hacking the water for a mile to the depth of thirty feet, from whence the logs are driven down the river forty miles to the hoom in the slack water just ahove the Folsom dam. The company has finished the first log drive of 5000 logs, which are now in the boom, whence they are floated down the canal of the Folsom Water Power Company to the mill in Folsom. The logs in the basin are mostly sugar pine and yellow pine, ranging in diameter from twenty-four inches to six and a half feet. This logging plant is the only one in the interior of the State that hrings the timber line close to tide water.

Books Received.

"*Prospecting for Gold and Silver*," hy Arthur Lakes, Golden City, Colorado, is a book of 207 pages, intended for the prospector and miner. Though largely made up of the writer's Colorado experience and observation there is a great deal of practical value to the prospector anywhere and much that is ahsolutely necessary for the unseasoned prospector to know. The hest thing ahout the book is the way it is written; the author is not trying to show how much he knows, hut uses little words and a homely style, making its contents interesting and of practical value. No matter how old or experienced a prospector may he he can get a good many pointers from this hook, and the heginner will find it exceedingly useful. It has ninety-eight illustrations and will be mailed to any part of the world by the puhlishers, the Colliery Engineer Co., Scranton, Pennsylvania, on receipt of the price, $1.

Lead Ore Importations.

Lead ores were imported during the fiscal year just closed at the following ports, as annexed:

Customs Districts.	*Pounds Lead.*
Arizona (Nogales)	1,211,079
Corpus Christi, Texas	1,872,599
Montana and Idaho	336,305
North and South Dakota	20,494
Paso del Norte	41,325,012
Puget Sound, Washington	3,347,017
Saluria, Texas	1,348,672
San Francisco	1,514,406

AT the Mansfield copper mines in Germany, reservoirs for compressed air are cut out of the rock, near the machinery to be operated thereby, and lined with cement. There are eight of these receivers, from 1235 to 3950 cubic feet capacity. A rock chamber of 2200 cubic feet capacity costs, it is stated, only one-third as much as an iron receiver of equal size.—Denver Mining Review.

Mechanical Progress.

The Inertia Governor.*

By Prof. John E. Sweet.

I sball show you that the first of these engines built with a shaft governor embraced the idea of the inertia principle, which has become a fashionable hobby, and I think, if you will give me your careful attention, I can show by tbe simple use of the English language and your reasoning powers there is no possibility of the inertia element being applied to a shaft governor beneficially except as a dash-pot, and to call the thing by its right name is to call it an inertia dasb-pot ratber than an inertia governor.

First allow me to direct your attention particularly to the fact you all well know—that tbe fly-wbeel of an engine receives its impulse intermittently, receiving nonc at tbe commencement of the stroke, a maximum at about the middle of the stroke, and none at the completion of the stroke. The mean in work of tbe successive impulses is (aside from friction) that given off by tbe belt, which is ordinarily pretty nearly uniform, and probably from 60 to 75 per cent of tbc maximum impulse. Now please bold tbis idea firm in your mind, that the power tending to disturb the uniform motion of the fly-wheel is about tbe greatest possible at each half revolution.

The claim made for tbe inertia governor is this: If tbe load is instantly removed from the engine, the surging ahead of the fly-wheel will, as it exceeds tbe uniform motion of the inertia weight, sbift the cccentric and cause an instantaneous, complete or partial cut-off to take place; or, if an excessive load is thrown on the engine, that tbe retarding of the wbeel will prolong the cut-off. From this reasoning it will be seen that the disturbing element tending to vary the cut-off is only from mean load to light load, or usually not one-half tbe disturbing element that obtains at every balf revolution of the engine from tbe piston; or, in the other case, if a full load be thrown on, it is only from mean to maximum, again not half the disturbing element that obtains from tbe piston at eacb half turn of the engine.

Further, let us assume that the fly-wheel is so light, and the acceleration or retardatiou be so much that it will over-run or under-run the inertia weigbt, tben the surging abead of the fly-wbeel will be so great at eacb balf turn as to render tbe engine unacceptahle.

Again, let it be claimed tbat the inertia governor is not expected to act instantaneously, but only to act by such acceleration or retardation as may take placc in two, three or four revolutions. I can only reply to that by saying that two, tbree or four revolutions is not half as quick as the centrifugal governor will act. Nothing is said by the champions of the inertia governor about variation in steam pressure. Of course, it is hardly necessary for me to call your attention to the fact that the inertia element in a governor has no influence wbatever towards correcting variations in speeds due to variation in steam pressure; and to meet this difficulty, which may be as troublesome as variation in load, the cngine must have an additional governor of some sort to meet this condition. When such a governor is supplied, it may be as able to meet variation in load as steam pressure.

Where there is friction on the valve or on the rod, tbe force to overcome this recoils on the governor (unless friction or a wedge is interposed to prevent it), and this tends to tbrow the ball in and out. Here the inertia dash-pot may become useful.

I hope to be able to show you copies of cards taken from an engine running under full load, and the load instantly removed, the indicator pencil being held on both before and after the change, to show what can be done by a centrifugal governor.

When one once realizes that, in the engine from wbich tbese cards are taken (the valve of whicb bas a maximum travel of four inches), the throw of tbe eccentric only has to change five-sixteenths of an inch to make the difference from cutting off at balf stroke to no load, and that tbe governor ball only has to change from a circular patb of about 14 inches radius to one of 14⅛ inches, it at once places the matter in wbat will no doubt appear to you a new light, and, *what is a fact*, will be readily perccived tbat witb a frictionless governor *the ball is just as ready to find its new path as the fly-wheel is its new velocity.*

In the first sbaft governor employed, not only with this enginc, but in nearly all of the early experimental governors of this class, Woodbury's and Wilson's among others, tbe notion prevailed that if the governor balls were located and pivoted so that, as the fly-wbeel surged abead, it would tend to swing tbe ball out, or, if slowed down, the momentum of the ball would naturally swing in, the governor would bc all the more prompt to act. In tbis case it was so hung that the distance tbrough space tbe ball would have to travel, from its inner patb to half cut-off in one revolution, was tbe same as if it continued in its upper positiou; or if in its outer position, or at balf stroke cut-off, it would have practically tbe same travel througb space whether it continued on in its outer path or shifted in in one revolution, and tbis was, I fancy, about as good an arrangement to make a worthless governor as one could devise. By turning tbe governor the otber end to, and making the path, tbe governor ball has to travel in one revolution about one per cent greater than the normal path in eitber case, the governor weight is given a degree of stability which tbe cards show is all that can be desired hoth in sensitiveness and stability, where friction in valve and governor mecbanism is reduced to a minimum.

*An address before the students of mechanical engineering at the University of Wisconsin.

American Inventors.

The French Society for the Encouragement of National Industry has published a list of prizes and prize subjects for the year 1896 that may be of interest to American inventors. Tbe grand prize of 12,000 francs, or, say, $2400, will he given tbis year to the author of tbe discovery most useful to French industry. The list for 1896 is very comprebensive, and covers almost every branch of industry. Tbere are sections, each offering a large number of prizes in electrical and mechanical arts, chemical arts, economic arts, and agriculture. In the mechanical arts section there are prizes for tbe best motor fed with some commercial oil; for an engine of from 25 to 100-horse power, using as a maximum when working 7½ kilogrammes of steam per bour, and per indicated horse power; to the manufacturer who first produces, mechanically, linen threads, of wbicb at least 100,000 meters go to one kilogramme, or, in the case of bemp, 15,000 meters per kilogramme; for a method of reducing leakage in marine boilers; for the best memoir on the cost price of the motive power of steam; for a small motor suitable for a home workshop, and whicb will work by the use of some simple power available in the bouse, or hy energy transmitted from a certain station; for improvements in the processes of retting linen and hemp in industrial use. In the chemical art section tbe prizes cover the utilization of waste products; a work or memoir of use to chemical or metallurgical industry; an experimental study of the physical and mechanical properties of one or more metals or alloys in current use; improvement in the production of sulphuric anhydride, chlorine and of cast steel and iron; also, the discovery of a new alloy useful to the arts; of comhustion in furnaces used for the production of ceremic clays and coverings; the substitution of sulphuric acid in dyeing, and especially in silk dyeing, by another compound which will give to the fibers tbe desired stiffness, without exercising any destructive action; and processes capable of yielding, hy certain chemical changes, useful organic products, such as quinine, cane sugar, etc. In the section of economic arts prizes will be given for the invention of a highly efficient petrolcum for lighting, for the discovery of metbods to diminisb the number of chimney fires and their resultant damage, and for an incandescent electric lamp of one-tenth candlepower when a current of .05 ampere is passing through it at a potential of 100 volts. In the agricultural section some of tbe subjects inviting competition are the best varieties of barley for brewing, the re-establishment of vineyards on chalk soil, a new forage plant, study of the culture of wine, and a work on tbc influence of various processes on vinification on the quality of wine.

Scientific Progress.

Improvement of Projectiles.

In an interesting communication to the London *Times*, apropos of tbe approachiug meeting of the Institution of Naval Architects in Paris, a correspondent draws attention to tbe progress which has recently been made in the manufacture of armor plates and guns, and hints that more attention might now be paid to tbe manufacture of projectiles. The improvement in the resisting power of armor which has been brought about during the last seven years is stated to be nearly 50 per cent. At an earlier period, when wrougbt iron was in use, 22-inch armor could have been perforated by the modern 12-inch projectiles, and 19-inch armor by 9.2-inch projectiles. To-day, in plates of average tbicknesses (6 inches to 12 inches), the best projectiles require a diameter nearly equal to the thickness of the plates they are required to perforate. Six-incb plates will resist perforation from a 6-inch projectile fired at 1960 feet velocity per second. A plate 10½ inches tbick has resisted well a 9.2-inch projectile with 1800 feet velocity. Tbis plate has already received five rounds of 6-incb projectiles with velocities of about 2000 feet per second. None of these latter made more than a splash upon the plate. Tbe projectiles go to pieces against tbese new plates. But the newest guns, with modern powder, are quite capable of doubling the energy of the projectile, and it is important to consider whether the projectiles hitberto produced would be capable of using up this energy. No doubt increased velocities migbt secure perforation, althougb tbe punch may go to pieces. It has been found, for example, that projectiles whicb, with 2000 feet velocity, did no serious damage to tbe plate, could be forced through the plate in places when the velocity was raised to 2400 feet per second. "May it not be," he asks, "that, as against the hardened plates, shots whicb will pulverize are less suitable for high velocities than shots made of a more ductile material, which will submit to a moderate flow of tbe steel during the instant tbat perforation is being effected?" It appears to he useless to double the energy upon a punch which goes to pieces with the energy already commonly employed. We need to be reminded that the modern increase in the size of ships of war is largely dependent upon this relative advantage of the armor over the gun. So long as armor is believed to be capahle of resisting perforation, attempts will be made to cover larger portions of the sbips with it, and the larger the ship the more easy it is to cover her sides with armor impenetrable to the average gun. Witb armor in the ascendant, ships will grow in size; with guns in the ascendant, numbers of ships, rather than large ships, will come into favor.

Modern high explosives are again bringing the principle of the old gunpowder engine into prominence. Col. Barker, superintendent of the British Royal Small Arms Factory, at Sparkbrook, in receutly speaking of the subject, made the point that while one pound of gunpowder was capable of developing over 170,000 foot pounds of energy, the new smokeless powders were capable of still more, and, at the same time, left no solid residue as ordinary gunpowder did on combustion. The latter developed in combustion about 280 volumes of permanent gases; the new powders gave off nearly 1000 volumes.

Waterproofing Brick and Sandstone.

At a recent meeting of the Australian Association for the Advancement of Science, Prof. Liversidge read a paper on the "Waterproofing of Brick and Sandstone with Oils." Experiments were made with tbe view of ascertaining the length of time that brick and sandstone are rendered waterproof or protected by oil. The oils used were the three commonest and most readily obtainable for such purposes, viz., linseed oil, boiled linsced, and the crude mineral oil known as "blue oil," used for preserving timber. The weatherings were made upon a flat portion of the laboratory roof fairly exposed to the sun and weather. Good, sound, machine-made bricks were experimented on. The amount of oil and water taken up by the sandstone was very much less than that absorbed by the brick, altbough the area of the saudstone cubes was mucb greater tban that exposed by the bricks. Equal amounts of raw and boiled oil were absorbed; the blue oil, however, was taken up in much greater quantity by botb brick and sandstone, but by the end of twelve months the whole of the 13½ ounces of blue oil had apparently evaporated away and the brick had returned to its original weight. The bricks treated with raw and boiled oils remain unchauged. After the second oiling in November, 1890, and exposure for nearly four years and two months, they had practically retained all their oil, inasmuch as tbey had not lost weight, and were also nearly impervious to water. It was noticeable that the sandstone cuhes treated with raw and boiled oils returned to their origiual weigbts, but do not appear to have lost the beneficial effects of tbe oils, being also practically waterproof.

Testing Lubricating Oils to Detect Gum.

A simple process for this purpose is credited to Nasmyth, aud consists of an iron plate six feet long with grooves planed on the surface and fixed in an inclined position, about one inch in six feet. Into the grooves at the upper end an equal quantity of each oil to be tested is placed, eacb kind in a single groove. The oils start on a race down the incline and if tbe right quantity has been used, about the fourtb or fifth day the gummy oils begin to coagulate and come to a stand, wbile the good oils go on, and at the end of eight or nine days no doubt is left as to which is the best.

A good oil that is known to be satisfactory can he used in one of the grooves as a standard of comparison.

Tbis method of testing has been used at the Stevens Institute of Technology, only in place of the iron plates and grooves a plate of thick glass was used. Tbe plate should be kept covered to exclude dust during the test.—Bell Crank in Machinery.

One of the important changes that is taking placc in engiueering practice is the winding of steam pipes over eight iuches in diamcter with $\frac{3}{16}$-inch copper wire, thus nearly doubling the bursting pressure. That the thickuess of sheet copper forming the pipe may be reduced to the minimum, and at the same time ensuring the full advantage of wire winding, an improved system of manufacturing steam pipes has been devised, which consists in using copper of the thinnest practical gauge to form the interior or core of the pipe, whilc the body proper is composed of steel wire wound closely around the core, the interstices being filled in solid with copper by electro deposition. The increased strength secured by wire winding is fully attested by the results of the wire-wound gun.

Electrical Progress.

Transmission of Energy Over a Single Conductor.

Says Tesla in the *Century:* "In connection with the resonance effects and the problem of transmission of energy over a single conductor, I would say a few words on a subject which constantly fills my thoughts and which concerns the welfare of all. I mean the transmission of intelligible signals, or perhaps, even power, to any distance without the use of wires. I am becoming daily more convinced of the practicability of the scheme; and though I know full well that the majority of scientific men will not believe that such results can be practically and immediately realized, yet I think that all consider the developments of recent years by a number of workers to have been such as to encourage thought and experiment in this direction. My conviction has grown so strong that I no longer look upon this plan of energy or intelligent transmission as a mere theoretical impossibility, but as a serious problem in electrical engineering which must be carried out some day. The idea of transmitting intelligence without wire is the natural outcome of the most recent results in electrical investigations. Some enthusiasts have expressed their belief that telephony to any distance by induction through the air is possible. I cannot stretch my imagination so far; but I do firmly believe that it is practicable to disturb by means of powerful machines the electrostatic condition of the earth, and thus transmit intelligible signals and perhaps power. In fact, what is there against the carrying out of such a scheme? We now know that electric vibration may be transmitted through a single conductor. Why, then, not try to avail ourselves of the earth for this purpose? We need not be frightened by the idea of distance. To the weary wanderer counting the mile posts the earth may appear very large; but to that happiest of all men, the astronomer, who gazes at the heavens, and by their standard judges the magnitude of our globe, it appears very small. And so I think it must seem to the electrician; for when he considers the speed with which an electric disturbance is propelled through the earth, all his ideas of distance must completely vanish. A point of general importance would be first to know what is the capacity of the earth, and what charge does it contain of electricity?"

The Gutta Percha Supply.

Whatever electricity may eventually prove to be, it has some qualities about which there is little doubt. One of these is its readiness to take a short cut, and run to ground at the slightest opportunity, instead of continuing along the conducting wire and finishing the work intended for it. The greatest care has, therefore, to be taken in insulating wire—that is, covering it with some material which is a bad conductor of electricity, and will prevent its escape. As water is sometimes used under very high pressure, so electricity is now employed, especially for transmission over long distances, and with the consequent heavy strain comes the need for insulating material of the highest efficiency. Gutta percha has been one of the insulating mainstays of the electric engineer, but disquieting rumors have been for some time prevalent as to the coming failure of the supply. Mons. Hourant, a French cutch merchant of Sarawak, has discovered that gutta percha can be extracted from the dried leaves of the gutta tree. The old native plan, which threatened to ruin the industry, was to cut down a tree to get the sap. A tree of thirty years of age would give only one catty of pure dry gutta; the same quantity is now obtained from two pluckings of the leaves. These pluckings are said not to injure the tree, which goes on seeding and reproducing its species. The millions of trees already cut down, and apparently destroyed by the native gutta hunters, will now come into service, as their stumps have sprouted out, much as an osier does, and although the shoots are too small to produce gutta, their leaves are as good for the purpose as those of an adult tree.

Electricity by Cloud Formation.

The belief that the formation of cloud is often accompanied by electrical effects is confirmed by Professor Schuster, who describes an experience in Switzerland. As he was descending from Dent Blanche after sunset, he found himself in a wide valley at a height of about 12,000 feet. A current of air was apparently blowing up the valley, and below him he observed the formation of a cloud at a height a little below the snow line. As night came on, and the descent over the glacier and down the valley was continued, a series of electric discharges were seen between the cloud, which was lying in a deep-cut valley, the sides of the mountain, and the blue sky overhead. The moist air was evidently flowing through the cloud, depositing its moisture in the form of drops, and leaving the cloud in an electrified state. Wherever water rubs against air, positive electricity is generated. Every wave that breaks into spray under the action of a strong wind leaves the water negatively electrified, the air carrying away the positive charge. Professor Schuster suggests that it would be of great interest to possess observations on atmospheric electricity on board ship while waves are breaking in the neighborhood. So far we have to guide us only the observations of Exner, who found on the Ceylon coast that the spray from breaking waves showed by the electrometer that it was positively electrified.

Studying the Arc Lamp's Light.

Lecturing recently on the arc lamp, Professor Sylvanus P. Thompson, F. R. S., said that most of the total light of an arc lamp is given off from the crater, less than ten per cent coming from the peak. The crater may be regarded as a flat, self-luminous area. If it could be seen in such a way that the peak never came between it and the eye it would give the greatest light when looked at perpendicularly and the least when the line of vision was horizontal with its surface. But the shadow of the peak has to be reckoned with, and it is found that the light given off is directly proportional to the area of crater actually exposed to view, being greatest at an angle of 40 degrees or 50 degrees. In the middle of the crater there may sometimes be discovered with the unaided eye a nebulous patch rather whiter than the rest, which seems to be in motion. By the use of appropriate artificial means this patch may be seen as a comma-shaped object which rotates round the crater at varying speeds, and not always in the same direction. It is a question whether this is a true physical rotation of the flame or only an optical effect.

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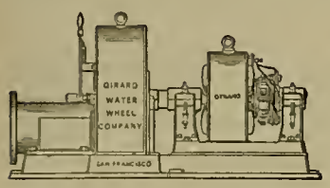
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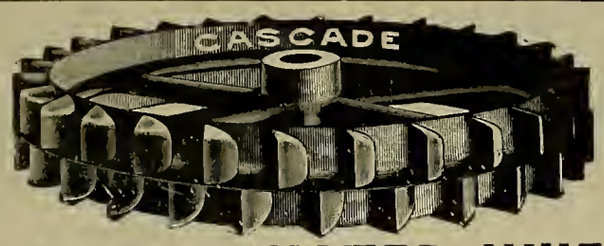


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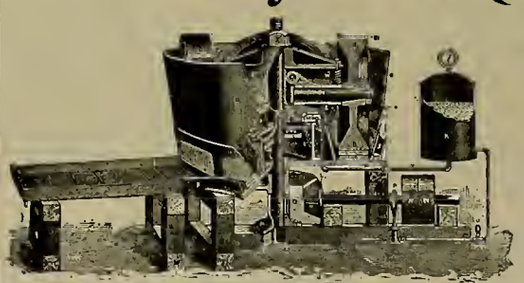
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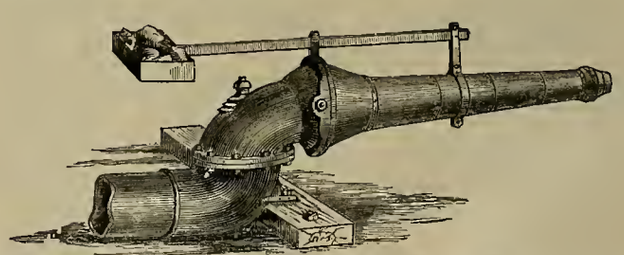
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Mining Summary.

CALIFORNIA.

Amador.

MIDDLE BAR.—*Dispatch*: The Montana mine is being opened up, the shaft is sixty feet deep.

At the Hancock mine, below the Montana mine, a tunnel is being run in by the Summers brothers.

SUTTER DISTRICT.—*Ledger*: A contract has been let by the South Eureka Mining Company to take down and reconstruct the old Downs' mill. It is to be hauled from its present location near Volcano, and is to be completed by the 1st of October.

JACKSON DISTRICT.—Superintendent Jas. E. Dye will commence operations on the Amador Queen mine next week.

SUSPENDED.—*Republican*: The operations at the Pioneer mine, near Plymouth, came to a standstill last Sunday. The mine is owned and has been worked by Dr. Boyson, who is the largest stockholder in the Kennedy. The doctor has invested considerable money in mining enterprises around Plymouth. For the last three months or more it is believed that this property has paid handsomely, the yield, we are informed, averaging somewhere about $12 per ton. They have been operating on the 400 level—the deepest in the mine. The ore body at this depth was worked out. Sinking, involving an additional expenditure of money which the doctor deemed inadvisable to undertake alone, became inevitable. He therefore determined to shut down until he interested other parties in the property. It is the prevailing opinion that the Pioneer will then turn out a fine paying mine.

AMADOR GOLD MINE.—There is some prospect of the early resumption of work by the reorganized company owning this mine under the name of Jackson Gold Fields. A deed was put on record this week conveying the title of A. S. Cochrane in the Amador Queen mines and mill to the company, and it is the intention to start work on the Amador Queen No. 1 as soon as possible. It may be mentioned that the old-standing indebtedness of the Amador Gold Mine to the Pacific Bank was settled last week. The total indebtedness was about $22,000. A compromise was effected by the payment of $15,000. The company has also sent word that it stands ready to settle any other legal claims against it.

Butte.

GENERAL NOTES—*Mercury*: At Forbestown a 1200-foot tunnel is being driven to tap the Gold Bank ledge 2400 feet below the surface. The tunnel is now in 800 feet.

At Oregon City extensive mining developments have lately been made in the Mascot and Standard mines, and the Louisiana and Rock River mines will be worked soon.

It is reported that a thirty-stamp mill be erected shortly on the Golden Summit mine.

A 800-foot tunnel is being driven into the Golden Butterfly, 250 feet of which is now in.

At the Magnolia a 500-foot shaft is being dug, which has already reached a depth of 260 feet.

A new quartz mill is to be built near Merrimac.

The recent rain was of sufficient quantity to cause the river to rise so that the canal at the Golden Feather cannot carry all the water. Hence operations at the mine will be delayed for awhile.

A report from Wyman's ravine says that Snyder, Rouse & McDonald have struck rich gravel.

Work on the Matti mine will be commenced in a few days.

Calaveras.

MINE BONDED. — *Citizen*: Jerkins and Wheelock have bonded the Eureka quartz mining claim, Cave City mining district, to P. H. Kean. It is understood that the bond of the mining property was made in the interest of Denver, Colorado, parties. The ledge is over three feet in width in the shaft and exhibits gold and very rich sulphurets.

THE SMADEKE MINE.—At the Smadeke mine the shaft is 280 feet deep. Ore assays $45 taken from the bottom. The gold is largely free milling; the sulphurets, of which it carries about three per cent, consist of arsenical pyrites, magnetic oxide of iron and petzite.

El Dorado.

GENERAL NOTES.—John Melton has four men at work on the Eagle King. T. H. Bradley is reopening the old Eagle mine. The Last Chance and Mt. Pleasant will soon resume. At the Daily mine Supt. Baughman is about to put up a ten stamp mill.

Inyo.

THE HIRSCH MINE.—Sup't Rives is pushing work at the Hirsch mine. Men are grading and lumber is on the ground for the tramway, etc.

Kern.

AMALIE MINING DISTRICT. — The Amalie Mining Company have put in a compartment shaft and ordered a new six-horse power gasoline hoist to take the place of the one now in use, it being too small to raise the large amount of ore that is being taken out. In widening the shaft four feet for 100 feet in depth they took out fifty sacks of shipping ore. This company also struck a new shoot of rich ore in tunnel No. 2, winze No. 3. While sinking and following a two-inch streak and breaking the hanging wall only when at a depth of sixty feet and preparing to do some drifting, a set of shots were put into the footwall to give sufficient room. After these shots were fired it was found that there was a thin streak of waste on what was supposed to be the footwall, and behind this was a three-foot ledge of high-grade shipping ore. This ledge has been sunk in on four different places by the Amalie Company, showing fine shipping ore in each place. From each of these shafts or winzes there have been drifts run from 50 to 100 feet each way. The Occidental Company have also sunk in two different places on the same lead, both shafts showing good ore. These six different workings cover a distance of 800 feet on the lead.

The Dull Bros. have made a remarkable strike in the Mayflower, with an eight-foot lead of milling and a small streak of shipping ore.

A. Sauser has located a lead carrying both gold and silver, and, it is said, has bonded it to some Colorado men. G. E. F.

Mariposa.

THE MAXWELL MINE.—*Gazette*: J. N. Cathey, who recently sold his mine below Benton Mills to the California Mines Company, has bought a one-half interest in Maxwell's mine in the same neighborhood.

Nevada.

GOOD PROSPECTS.—*Tidings*: The North Star Mining Company in blasting out the foundation for their new power, found numerous clay seams through the rock and were compelled to put in a stone foundation. Their intention is to have 250-horse power from the pipes and water supply. They can duplicate the compressor and get 600 additional horse power from the same water plant and existing pipes. This plant is to work Massachusetts Hill and other properties belonging to that company.

A MINE BONDED.—*Union*: The Plumbago mine, near Moore's Flat, has been bonded to Col. Taylor for $20,000. A payment has already been made on the property. It is owned by Chas. Haggerty and has produced some fine rock in times past. Work is carried on by the tunnel process. Mr. Taylor contemplates erecting a ten-stamp mill on the mine.

THE LAST CHANCE.—Some Sacramentans recently purchased the Last Chance quartz claim from the Yuba Mining Company, paying for it $1,500. The mine is located on the South Yuba river above Washington. The *Herald* learns that the new company is now running a tunnel on the claim, and they are taking out some fine-looking rock.

Placer.

THE PEDLAR MINE.—*Sentinel*: The Pedlar mine at Eucbre Bar is being worked by a company of capitalists of whom Senator Geo. C. Perkins is at the head. The mine is on the north side of the river opposite the Ford & Bentley property. The ledge is 2½ feet thick and lies in a slate formation. There are two tunnels—500 and 100 feet—which will be driven ahead.

THE HOBO MINE.—The Hobo mine at Shady Run is located near the old Harvey mine on the white gravel lead. A main tunnel is driven over 1200 feet, opening up good-looking gravel.

THE FOSS MINE.—The Foss mine at Lowell Hill is at present working eight men under the management of G. K. Wood. The gravel in this mine is also of the white lead. The tunnel is in about 2000 feet and has considerable ground opened up ready for drifting.

THE ALTA.—At the Alta mine the water has been pumped out of the old mine and at present air pipes are being placed in the old works; and if the condition of the old works will permit, a tunnel will be started to meet the main tunnel which is now being run. The main tunnel is now in about 1800 feet, and it will be several weeks yet before the old works will be reached. Some very good gravel has been found in the main tunnel. Wm. Doolittle has charge of the work.

Riverside.

TEMESCAL TIN MINES.—The English owners of the Temescal tin mines are thoroughly prospecting their property with a view of establishing reduction works sufficient tin ore can be found to warrant the expenditure. A number of shafts have been sunk and other holes will be made in the course of development. It would not be at all surprising if there were some gold mines unearthed in this search. The work is under the supervision of H. B. Varcoe.

TWENTY-NINE PALM DISTRICT.—The Virginia Dale gold property in the Twenty-nine Palm district has been bought by Eastern men. The purchasers will put in a ten-stamp mill and develop the mine.

San Bernardino.

THE LOST HORSE.—The Lost Horse mine, forty miles east of Banning, is down 120 feet at which is two and a half feet of ore. Levels were run at 100 feet and sinking will go on until the 200-foot level is reached. At present a two-stamp mill is run, operated by a gasoline engine. It is the intention of the owners to put in a five-stamp mill as soon as the main body of ore is reached.

San Diego.

RENEWED ACTIVITY.—*Union*: Gold is coming from the Banner and Julian districts. Assayer Aubury has two bars of bullion aggregating over $2,100, from the Elebada mine near Banner, the product of ore taken out in sinking a fifty-foot shaft. The ore is very regular in character and the vein shows no indication of being "pockety." The shaft will be continued down to the 100 foot level before drifting is commenced.

The Ready Relief mill at Banner, last week crushed nineteen tons of ore from the Ranchito mine.

A project is on foot to open up the old Mission mine, sixteen miles from this city. Every evidence goes to show that at some time this body of quartz was worked by the Indians. A large dump of broken quartz is to be seen, but so far no openings or workings have been found.

A. G. Adams left for the desert country on Wednesday last, to inspect and open up a number of gold properties near Picacho. H. Harrison and Mr. Curtis are doing some prospecting near the Colorado river, above Yuma, and are meeting with fair success. R. S. Dunlap was in from Dos Palmas last week with samples of ore for assay from a large ledge of galena, which he is opening up.

T. V. James, A. D. Richmond and Harvey Carr, Chicago capitalists, will leave for Pine Valley on Tuesday and after inspecting the mineral resources there will continue overland into Lower California. The Cortelyou mill at Pine valley has been grinding ore from the Hawkes Bros.' mines on Indian creek. The results are very satisfactory.

Shasta.

TO BEGIN WORK.—*Democrat*: C. A. Hascall will commence operations on a large scale on his Mule mountain and Salt creek properties in a few days. Mr. Hascall represents eastern capital. The object of this syndicate is to sink on their mines for the purpose of thoroughly developing them and then to put up a plant that will successfully work the ores and save all the gold contained in the basest of it.

The Shasta County Development and Mining Company will follow about the same course and will do some extensive development work in a very short time.

AN ANCIENT CHANNEL.—The *Searchlight* says on Dog creek, near Delta, a channel makes its appearance on the east side of the Trinity range above the head of Chase gulch, continuing southeasterly to a point known as Old Diggings, on Dog creek, where it made a large spill of gold and on its way to this point feeding Chase and McCall gulches. From Old Diggings it runs parallel with the present Dog creek and makes very few spills to its point of outlet. The system consists of a lava capped channel underneath which lies blue gravel and that is to be developed.

Sonoma.

QUARTZ AND PLACER GOLD.—R. G. Burton is credited with the discovery of a vein of gold-bearing quartz, in Dry Creek valley, ten miles northwest of Healdsburg, and placer gold taken from the sands close by. The usual "excitement" is reported.

Trinity.

AT THE BROWN BEAR.—Chas. Dobler, superintendent Brown Bear mine, has completed a tank above the mine which holds 15,000 gallons. There are 1400 feet of two-inch pipe laid from this tank in separate lines, which cover the mill, houses, etc., under a pressure of 100 feet.

AT TAYLOR'S FLAT.—*Journal*: Pelletreau and Hedges have struck gravel diggings on the bench of the river opposite Taylor's Flat.

Mr. Finch, of Sacramento, has an agreement of sale upon and has taken possession of Canadian Bar, which has been lying idle for some time.

At the Don Jaun mine W. A. Huestis, Moody & McIntosh, have cleaned up $575 from 109 hours run of 200 inches of water. They worked 1906 yards of bed rock.

There are more prospectors along the river than for many years and a good deal of work is being done. It is reported that the Trinity River Tunnel and Mining Company will resume operations at Taylor's Flat this fall.

OPERATIONS AT MINERSVILLE.—The *Record* is informed that the French company now operating on the old Deiner property, has sluiced off several acres of ground and expect to clean up forty or fifty thousand dollars. They have forbidden the men to walk over the bedrock unnecessarily. The *Record's* informant says that he could go into their ditch and get out a hundred and fifty dollars to the pan almost anywhere in the ditch. The Count de Kergoley is in charge.

NEW RIVER NOTES.—The Sherwood mine, because of litigation, is idle at present.

A San Francisco company has recently bonded the Hoboken Flat property belonging to Moses Patterson on lower New River, and have half a dozen men at work opening it up.

There are about a dozen men prospecting along Pony creek. A couple of them took out two nuggets one day last week which weighed $57.

U. G. Day, superintendent of the Enterprise mine, on the East Fork of the North Fork, has a bar of gold weighing 120 57-100 ounces, the result of a run of about 140 tons of quartz. He reports that they are now taking out forty dollar rock.

Tuolumne.

WIDE WEST MINE.—The Wide West, on Burro creek, is being examined by experts who represent a mining syndicate that have in view its purchase should it be favorably reported. It is a property that has been formerly worked and abandoned through the inability of incompetent management and the use of ancient appliances. The ledge is three feet in width incased in footwall of slate with a sandstone for the hanging wall. A five-stamp mill is on the ground. A tunnel of seventy-five feet in length crosscuts the ledge at which point stoping began.

NEVADA.

THE BRUNSWICK LODE.—The Brunswick lode, the present scene of operations by the combined Comstock companies, lies about 7000 feet east of the main Comstock lode. It is a vein of unusual size, averaging 100 feet in width, and is traceable on the surface by croppings for 14,000 feet. At several points openings have been made in times past in chimneys of ore that showed on the surface, and from some of these gold and silver have been extracted.

Beside the Occidental the only work of any extent is at the north end, in the Monte Cristo mine, where paying ore was extracted to the depth of 150 feet, when a flood of water prevented further sinking. At the St. John's mine, the Bailey, Alabama and half a dozen others, a considerable amount of surface gouging has been done, and from the first two a considerable amount of money was taken out at various times by parties who leased the ground. At most of the mines there was trouble with water, and the short cuts and tunnels run were of little value as drains. At all the points where work was done in the early days ore was found which should pay at present with the improved facilities for mining and milling. The Brunswick lode was tapped by the Sutro tunnel at a depth of a little over 1300 feet. This gives drainage and affords facilities for prospecting and ore extraction. As in working upward all ore and waste will descend to the tunnel level by force of gravity, raises and other openings may be made at small cost.

The ore of the lode yields about equal amounts of gold and silver, and is of a character not difficult to work. Milling can be done by water power, and, if required, water can be taken to the lode and used anywhere above the tunnel level for driving machinery.

Esmeralda County.

FIRST PAYMENT MADE.—The owners of the Silver Star group of mines are said to have received a first payment of $100,000 from Senator Wolcott, who has bought the mines. The whole amount to be paid is not known. It is understood that the mills will be built.

James O'Hale is putting up a cyanide plant to work the tailings from his mill in the southern part of the county. The tailings are worth about $12 per ton, and he expects to realize from $10,000 to $20,000 on the lot.

OREGON.

A LONG TUNNEL.—*Democrat*: The management of the Union and Companion mines at Cornuopia have decided upon running a tunnel 1,000 feet in length, and other work is contemplated by which these mines will be put under a complete state of development before a reduction plant is erected.

IN SOUTHERN OREGON.—*Tidings*: A run of three cars of ore from the Homestake mine, near Woodville, yielded $350, about the same as from that previously milled.

W. L. Chapman & Co., of Portland have men building a wing dam in Rogue river, one-half mile above Gold Hill.

Campbell & Co., of Portland, have bought the Hamalin claim on Rogue river, fifteen miles below Gold Hill, and have men building a reservoir for hydraulic purposes.

THE TOLO MINING CO.—The carload of ore shipped by the Tolo Mining Co. to the Ashland Mining Co.'s mill resulted favorably, averaging $35 to the ton. There is considerable more of the same kind in sight.

BRITISH COLUMBIA.

AROUND NEW DENVER.—Two more tunnels are to be run on the Ruth. This mine made a shipment recently of twenty-eight tons, two of which were carbonates. This property is across the gulch from the Slocan Star.

The Slocan Star has commenced shipping again, six teams being employed in transporting the ore to Three Forks.

Yanill Bros. have bonded the Black Fox and Daisy to Porter Bros., the railway contractors, for $15,000. One thousand dollars was paid down and the other payments will extend over a year. These claims are on the south fork of Kaslo creek and are about five miles from the railroad now building. A well defined ledge, twelve feet in width, can be traced through both claims, and the assessment work has shown up two feet of clean ore. Several men will be put on this summer and the ore packed over the trail for shipment by rail to Kaslo.

An average of twenty claims a week are being recorded at New Denver. Many of these locations are at the foot of Slocan lake and are rich in gold as well as silver.

The prospectors owning claims on the Galena farm have built a trail seven miles in length from their properties to Scherlon. The trail also taps the claims on Eight Mile creek.

The New Columbia and Cordelia, two North Fork properties, have been bonded to a company of Canadian Pacific officials.

ON CRAWFORD CREEK.—The owners of the Silver Boy and Humboldt mines on Crawford creek have been offered $40,000 for a bond on the property. The property assays 70 ozs. in silver and 60 per cent lead.

ALASKA.

REPORTED FIND OF ANTIMONY.—*Record*: V. VanBuren has recently discovered on the southeast end of Admiralty Island, about 1½ miles back from salt water, a well-defined three-foot vein of nearly solid antimony. The vein runs through a porphyry formation of a gray color. It is easy of access from the beach and no gulches have to be crossed to reach it.

THE JUNEAU MINING COMPANY.— *Record*: The Juneau Mining Company will have taken the last load of machinery for their 30-stamp mill to the Basin by the last of the week. There yet remain 200 cords of wood to be hauled to the mill, after which the teams will be sent to California.

THE BEAR'S NEST.—Parties interested in the Bear's Nest property on Douglas Island have arrived with two diamond drills for sinking in search of the ore.

WYOMING.

ASBESTOS FIND.—A Casper dispatch says: "Messrs. Currier, Nelson and Johnson, who have been prospecting for asbestos on Casper mountain, have brought in 500 pounds of fiber equal to any of the Canadian product." The asbestos is of a greenish shade, and the find is regarded as valuable.

IDAHO.

THE LUCKY BOY CO.—The Lucky Gold Boy Miniug Company, composed of Salt Lake capitalists, and owning a group of mines in Custer county, Idaho, has purchased the properties and mill of the Dickens-Custer Mining Company, adjacent to the Lucky Boy group. The Dickens-Custer mines were formerly owned by J. B. Haggin, who sold them to an English syndicate. They have produced about $4,000,000 in gold, but have been idle for some time. The consolidated properties will be operated by the Lucky Boy Company on an extensive scale.

ARMS AND AMMUNITION.—Under instructions from Governor McConnell of Idaho Adjutant-General Caldwell proceeded to the Cœur d'Alenes last Wednesday with eighty stacks of arms and 5000 rounds of ammunition, where he will recruit and equip a company of 140 militia from the miners of the Bunker Hill and Sullivan mines in anticipation of an outbreak. It is asserted at Canyon Creek that

the Canyon Creek Union has openly threatened that they intend closing the mines if they have to kill or run every non-union miner out of the country.

UTAH.

WATER FOR THE MARSAC.—*Tribune:* The Marsac mill has been somewhat short of water since the great Ontario drain tunnel was completed, and is now making arrangements to secure the overflow from the Park City waterworks reservoirs in Empire canyon.

To this end a tunnel will be driven through the ridge between that canyon and Ontario canyon, and a flume built leading from just below the reservoirs to the flume coming from the mouth of the Ontario tunnel near the Ontario mill. The proposed flume will be some 2300 feet in length, and will be completed this month.

A good strike of ore is reported in the Cumberland group of claims on Tresure hill.

A new mining company was incorporated at Provo, the Grand Central Mining Company, capital stock is $250,000; $100,000 subscribed.

SOUTH DAKOTA.

HARNEY PEAK TIN COMPANY.—Black Hills *Mining Review:* The rumors afloat on the settlement of the American and English stockholders of the Harney Peak Tin Company, we are sorry to chronicle, are wholly unreliable, as no such settlement has been reached, nor is there likely to be at once. It is safe to say that the American shareholders are using all consistent means to bring the adjustment of affairs to a head; and when such a time arrives it is more than likely an American engineer will be in charge. The plea that the appropriation of money drawn from the English shareholders was in many instances misupplied, seems to be more of a chestnut when taken into consideration that all drafts for money from them were made under personal advisement by metallurgical and mining engineers who had been sent by them to America to carefully investigate the mines.

COLORADO.

CAPITAL NEEDED.—Idaho Springs *News:* The miners are working under extreme disadvantage. Capital is needed to put up hoisting plants, concentrating mills, etc. The long haul to railroads is also against them. The character of ore in the camp is principally hematite on the surface, of which there are great bodies. This is practically worthless, but as depth is gained, it changes to iron and copper pyrites which will undoubtedly pay well by concentration.

SAN MIGUEL COUNTY.

COLUMBIA.—Telluride *Republican:* Men are at work wiring the Columbia mine, and in a short time it will be lighted by electricity.

SMUGGLER-UNION.—Work has been commenced on the addition to the Smuggler-Union mill to make room for ten more stamps.

GOLD KING.—The new 100-horse power motor is now at the Gold King, and the work of putting in position was commenced to-day. The old motor will be taken to the Turkey creek mill.

ARIZONA.

AROUND YAVAPAI.—*Journal-Miner:* It is given out that the Yarnell mine and mill will be started up again soon on a more extensive scale than ever before. With the sale of the Johnson mine, the Grey Devil group and the property in Fool's gulch and the probable erection of mills on each and the working of the Yarnell mine and mill, handreds of men will be employed in that section, and the bullion product increased.

IN GENERAL.—The Phœnix *Republican* says: The most active section of Arizona has been Yavapai county and regions around Prescott. The great Congress mine, an inexhaustible treasure box, that has yielded much riches even to the depth of 1,500 feet, is now working 250 men, while the hills in every direction from Prescott are lined with mines and mills, miners and prospectors, most of whom are doing well. The Santa Maria country, between Mohave and Yavapai counties, is looking up, and several of the larger claims will be worked extensively and systematically.

HUMBUG DISTRICT.—The Columbia Gold Mining Company has bought a group of eighteen mining claims in Humbug district and will develop them on an extensive scale.

GLOBE.—Work will be resumed at Globe in both mine and smelter about the 1st of August. Superintendent Berray has been notified of the transfer of the stock by the Old Dominion Copper Company to the purchasers, the Lewisohn syndicate, and the election of S. A. Bigelow of Boston, Mass., president of the company. A. D. McLean, lately of Morenci, represents the new concern.

A NEW CAMP.—A mining camp is being built up about ten miles from the Gulf of California, near the town of San Antonio. The mines, three in number, are gold properties and are, at present, being worked under a bond by a wealthy company which proposes to purchase the mines if the veins continue to expose the same character of ore as is now being worked. The pay-rock is from three to five feet wide and gives an average of $25 per ton in gold. The mines are owned by J. Gandolfo, of Yuma, Arizona.

LOWER CALIFORNIA.

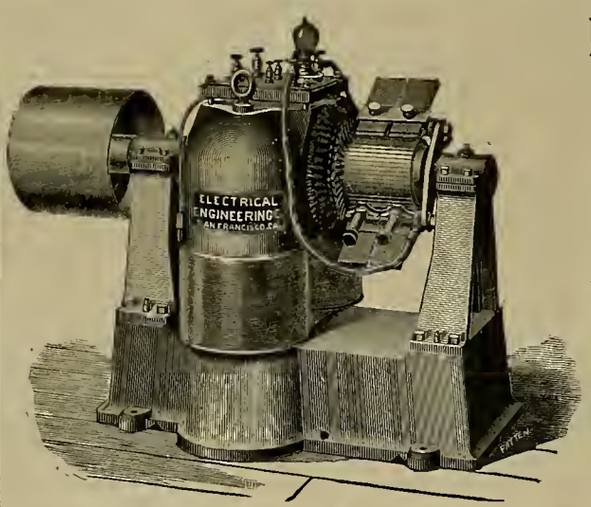
Considerable activity is noted in the northern half of Lower California in a mining way. Further south, at the San Juan silver mines, and the Calmalli gold mines, the output is steady and has ceased to excite remark. The last shipment of gold from the Calmalli mines was $15,000. The average output is reported to be $30,000 per month. The San Juan silver mines get their supplies and ship their product through Guaymas, though Cranz Bros., the owners, have repeatedly offered to throw their immense business to San Diego if steamers are provided to allow of regular communication. The same thing has been said by the French manager of the great Boleo copper mines at Santa Rosalia, whose output compares favorably with the Lake Superior mines.

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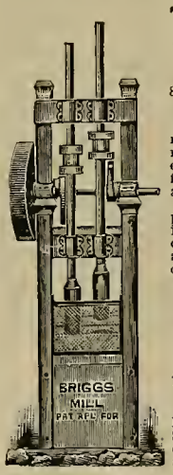


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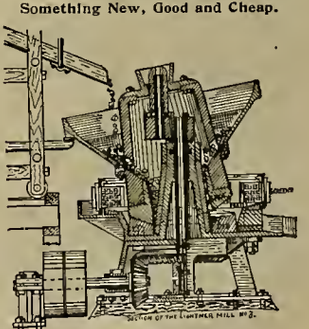
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The most substantial mill ever offered to miners; discharges both ends and front; will crush from 6 to 10 tons per day; any one can set it up. Complete as per cut, price $450.00. This mill is furnished with 9-inch cast steel shoes and dies, and substantial independent iron guides.
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Practical Information.

California Prehistoric Remains.

Some weeks ago, in the asphaltum mines in Kern county, miners working 120 feet helow the surface excavated the skull of a large prehistoric animal.

The hones were imbedded in the asphaltum deposit, and in close proximity were pieces of wood in a fair state of preservation. Fossils in the earth are nothing uncommon, hut this skull is more than a fossil, and has a peculiar significance in the study of geology and natural history. There are several teeth in the jawhone that still have a coating of enamel, which proves that æons of ages ago beasts moving amid the desolation of earth had teeth differing none either in texture or form from the present age. The enamel is well preserved in color and suostance, though inside it the dentine is changed to asphaltum.

The head is not perfect, as part of it had either turned to the black suhstance itself or rotted away, although there remains enough to show that it was larger than a horse's head and shaped like that of a moose. The teeth are larger than those found in a horse, heing ahout three or four inches long and one and one-quarter inches wide, and are arranged in long rows. From the forehead a massive horn protrudes like the spike of a rhinoceros, hut of a different shape, being flat and resemhling the hroad portion of the deer's horns. It gives the head a formidahle aspect. Now it is merely asphaltum that indicates the hone fiher.

As a scientific discovery, the importance of these fossiliferous fragments can he appreciated when it is known that scientists differ regarding the origin of asphaltum. Some of the most eminent geologists have satisfactorily reached the conclusion hy inductive processes that it is a mineral formed hy certain chemical action, while others, whose standing entitles their opinions to quite as much respect, claim it is a vegetahle substance, or at least organic, and prohably was animal matter similar to that found at the hottom of the ocean.

The fragments are now packed ready to be sent to the University of California, where they will be classified, if possible, and preserved as some of the most interesting specimens in the Berkeley Museum of Natural History. The fragments imhedded in asphalt will also be forwarded, and no doubt there will not he much difficulty in determining its species.

Practically little geological work has heen done in the regions where the fossils were found. Fifty miles west of Bakersfield, high up in the desolate mountains skirting the western San Joaquin valley, this strange land lies. Blinding ashes and parched dust, pools of liquid asphaltum and streams of that pitchy viscid stuff trickling from cracks in hillsides; creeks and little lakes of sulphurous water emitting a gas that ignites and blazes, great masses of hitumen protruding from the ground like lava grown cold; all these together and a soil on which a strange stunted underbrush grows form its characteristic landscape.

There are large heds of infusorial earth 300 to 400 feet thick and extremely light. The surface is bleached intensely white hy the sun burning out the little asphalt oil on top. Underneath is a hrown, impalpahle dust like volcano ashes—a mighty ash heap and yet composed of shells of the infusoria, visihle only under a powerful microscope.

From the presence of this dust it may he taken that asphalt is infusorial also, being formed out of animal matter, of infusoria, while the mineral matter, or white shell dust, remains ahove it.

There are beds of brown sand, almost a sandstone, parallel to the direction of the asphalt deposits, and seemingly underlying them in the strata. This hrown sand coheres through the agency of asphaltum material in it, and has stood like a dike against the erosion as geological periods.

One more interesting feature of the district is the mineral tar, as it is commonly called, or liquid asphaltum. It exudes in many places and trickles down hill until a hollow is reached and black pools are formed. In those pools lizards, beetles, rabhits, birds and even a deer and a bear have been found, all emhalmed hy the liquid that kills them.

Blew Itself Out.

The "Big Moses" gas well, on the Spencer farm, on Indian creek, Tyler county, W. Va., which was struck by lightning recently, extinguished itself the same evening, after consuming the derrick and all the combustihle matter within reach. The pressure was so great that the well simply blew itself out, after furnishing the natives of that country with a grand sight.

No one could go near the hole, aud the swaying to and fro of the great, invisibly supported flamheau, hundreds of feet high, and its deafening roar, made an awe-inspiring comhination.

Nothing had ever been struck that approached the "Big Moses" in magnitude. The pent-up pressure, when furnished an avenue of escape through an eighth and one-fourth-inch hole, for three months defied every effort to hring it under control. The earth tremhled within 1000 feet of the well, and the roaring monster could be distinctly heard for a distance of twelve miles. No accurate gauge of this Jumho of gas wells has ever heen taken. At one time a partial test was made with an ordinary steam gauge, and it showed a pressure of forty-four pounds from an 18½-inch opening. At another time, from a three-inch opening, it showed a pressure of 600 pounds the first fifteen seconds. Then attempts at a complete test had to be ahandoned. When flowing through the casing its daily capacity was estimated hy experts to be from 80,000,000 to 120,000,000 cuhic feet.

The well was struck in Novemher of last year, and during six months of the time since then the valuahle fluid went to waste. Taking the lowest estimate, 80,000,000 feet a day, and compute its value at 25 cents per 1000 cuhic feet, as charged hy the Pittshurg companies, for a period of six months, and the result shows that the selling value of this wasted gas in Pittshurg would be $3,640,000.

The Carnegie Gas Company's expert visited the well and estimated its capacity to be great enough to supply fuel for the entire Homestead plant, if it were accessihle. Another expert expressed the opinion that its output would he equal to the demands required to furnish the entire city of Pittshurg for domestic purposes.

The owners expended $5000 in shutting the well in, and three months afterward it broke through and forced its way up through the surface. A powerful pump was then set up near the well, and for five days they pumped water into the monster, with the hope that the gas pressure could he crowded hack, and give them a chance to put in a packer, hut their efforts proved futile, for the water was again forced to the surface from fissures that it made, and the result was a dozen of geysers spurting up into the air. Some of them made their appearance half a mile from the well.

"Convergence of Ancestry."

It goes without saying that a man has two parents, four grandparents, eight great grandparents and so on, so that if we go back ten generations, doubling at each step, we have 2048 ancestors. This sort of argument has heen used hy superficial genealogists to show that 1000 years ago each of us had more ancestors than the total population of Europe, hence we must each he descended from every European of that day.

The absurdity of this sort of reasoning has just been pointed out by Prof. Brooks. His immediate ohject is to estahlish a point in the theory of evolution, but he confutes all silly genealogists at the same time. While it is true that we do have four grandparents, they need not be four separate and distinct persons. First cousins have not more than three separate grandparents; if they are douhly cousins, they have but two. So in the tenth generation one's 2048 ancestors are never 2048 separate persons; they ahound in "duplicates," so to speak, as every one knows who has tried to trace his descent, not in one line, hut in all possible lines. These duplicates abound especially in small communities, whose inhabitants have intermarried for years.

Besides this the lines from a given pair of ancestors tend to become extinct sooner or later, so, as ancestry is traced back, the prohahility is that all the persons living in a given community will be found to he descended, not from all, but from a very few—perhaps only one or two—of the inhahitants of the community as they were centuries ago. So instead of having all Europeans of the year 900 for our ancestors, the probahility is that we are descended from comparatively few of them—the number may he technically many thousands, hut one individual does duty for several scores, or even several hundreds of these, the lines of ancestry converging upon him from many different directions. This is what Prof. Brooks calls the "convergence of ancestry."

An Important Decision.

On the 18th ult. the U. S. general appraisers made a decision of considerable importance to American lumhermen, hy which Canadian lumher manufacturers must hereafter pay a 25 per cent duty on the value of any lumher destined for the United States markets which they may wish to joint or match or head or prepare in any way except planing of one or two surfaces. This gives our American manufacturers a 25 per cent advantage over the Canadians on every spruce or pine board which is to he tongued and grooved, jointed, moulded or headed, or in any way advanced in manufacture beyond the simple planing of one or two sides to hring the same to an even thickness. This decision adds at once $2 to $4 per thousand feet to every American spruce hoard or plank intended for "dressed lumher," according to the interpretation of the general appraisers. It will lead to a largely increased demand for American spruce boards and plank, and to more firmness in prices. The Canadian lumher mills cannot afford to pay 25 per cent ad valorem duty on dressed lumher and compete with American mills.

Private Electric Motors.

It is now almost as easy and cheap to have an electric elevator in a private house as in a large office building. The cost of operating an electric elevator in, say, a five-story house, making fifty or sixty trips every day, will not exceed $3 or $4 per month. The devices for operating these elevators have been so improved that an invalid or a child can manage them. The old lever arrangement can be dispensed with, and the elevator ascends or descends on the pressure of a button. It will stop only at each floor and will start only when the elevator door is closed.

STATISTICS show that an inch of rain falling upon an area of one square mile is equivalent to nearly 16,000,000 gallons, weighing 145,200,000 pounds, or 72,000 tons. Assuming this water to have fallen from clouds about half a mile, or say 3000 feet above the earth, we have for the energy represented hy it about 28,000 horse power. With pumping machinery working at the low rate of consumption of two pounds of coal per horse power per hour, it would take 200 gross tons of coal to raise the water represented hy an inch of rain on a square mile to the assumed height of 3000 feet.

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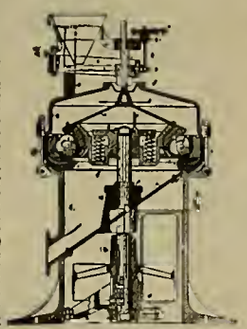
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GENTLEMEN:—We purchased a No. 2 American Rock Breaker and a No. 2 American Ball Pulverizer from your company about one year ago. The latter part of April, 1893, we started up for regular work, since which time we have run both of said machines to the full extent of our demands and to our entire satisfaction. The first 700 tons of hard iron ore that we pulverized for paint purposes was ground without taking the Pulverizer apart, and without expending one dollar for repairs for either of these machines. Of the 700 tons spoken of, about 200 tons was Lake Superior Specular iron ore, containing some 70 per cent iron; a very difficult ore to pulverize. The remainder was a red fossiliferous iron ore, carrying quite a per cent of silex, which cuts out buhr-stones rapidly. We find that the steel balls, which were when new 5 in. in diameter, now caliper 4¾ in., and are perfectly round and smooth. The grinding track shows very little wear, and the driving track shows LESS; in fact, the wear is almost imperceptible. These two machines crush and pulverize more than one ton per hour with LESS than 12 H. P. We do not know of any Crusher or Pulverizer that can compare with the output of these two machines in quantity, quality, small amount of wear and tear, and like power. In our opinion, you cannot recommend them too highly. Very truly yours,

CLEVELAND IRON ORE PAINT CO.



THE AM. BALL PULVERIZER
Morris Patent.

PLACER
Amalgamators, : Dredgers, : Shovels.

Complete "Lancaster" Gravity Gold Amalgamating, Hoisting and Dredging plants furnished for treating large quantities of low grade placer ground and pulverized free milling quartz at small cost with minimum supply of a water. **Highest possible Gold yield insured.**

The "Lancaster" 1895 Land or River Dredges, Grapples, Scoops, Steam Shovels and Cableways are of the most improved construction. Success guaranteed. Capacity, one hundred tons hourly and upward, if required. **Crushing, Pulverizing, Concentrating, Screening, Pile Driving and other machinery also built.** Investigation and correspondence solicited.

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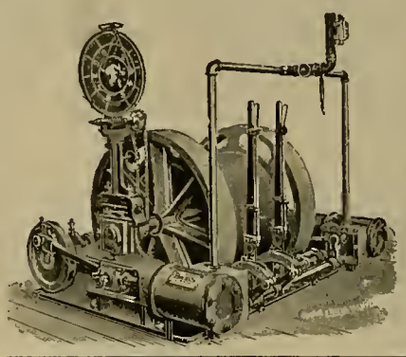
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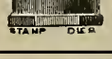
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MANHATTAN RUBBER BELTING, PACKING AND HOSE,
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LIGHT STEEL RAIL.

Market Reports.

The Markets.

SAN FRANCISCO, July 11, 1895.

There is an advance in iron, steel, and products therefrom, of 10 to 30 per cent. Silver slightly advanced during the week.

Concerning copper, under date of July 1, D. Houston & Co., New York, say: Firmness and strength have been apparent throughout the month; transactions during the past 30 days aggregate a total of several million pounds of each variety, a large proportion of the business being done at 10¾ cents for Lake, with deliveries running two or three months ahead. Lake brands have been selling on a basis of from 10¾ to 10¾ cents per pound. As most of the large consumers contracted for several months' supplies of copper in April, when prices were very low, they have not been compelled to make any purchases since. Producers, therefore, have yet to reap the benefit of the rise in copper to any very considerable degree. The market is in excellent shape, and singularly free from anything suggesting apprehension regarding its future course. Conditions have changed, and the whole trend of affairs is towards a higher range of values, with the prospect of an increasingly active demand, both at home and abroad, especially during the fall. Electrolytic and casting copper has met with good request, and sales of considerable quantities have been effected at full market rates. Among the latest transactions reported is a sale for export at 10¾ cents by the Calumet & Hecla Co. The quantity involved is understood to be 1000 tons, and said to be for shipment to Russia. The effect of the sale was to impart additional tone to the market. Prominent financiers in Europe, of great influence, are interested in copper, the soundness of the metal at present attracting much attention. There is no oversupply disturbing the market.

From 1880 to 1891 consumption increased about fourfold, and from 1,000 pounds per capita in 1880 to 3.006 per capita in 1891. Taking the amount of copper produced in the United States for the twelve months ending May 31, 1895, less the amount exported, as representing domestic consumption during that period, it equals only about three pounds per capita, as compared with 4.008 per capita in 1892. Is it too much to believe that, when consumption of copper in the United States fully reaches normal proportions again, it will then be much nearer five pounds per capita than three pounds? In that event, this country could scarcely spare much more than 10,000 tons per annum for export on the basis of present production.

Exports of copper from the United States for twelve months ending May 31, 1895, were 69,953 tons, or 27,975 tons less than for the twelve months ending May 31, 1894. The shipments from this country during these two years to England and France alone was as follows, in pounds fine:

	May 31, 1895.	May 31, 1894.	Decrease.
To England	60,692,310	103,761,294	43,068,984
To France	24,072,805	29,557,012	5,484,207
Totals	84,765,115	133,318,306	48,553,191

Here we have England and France during the last twelve months ending May 31, 1895, taking an amount of copper produced in this country equivalent to the entire annual output of the Calumet & Hecla, Quincy and Osceola mines combined. If these three leading Lake producers should announce that every pound of their production for a whole year was to be shipped out of the country, what a factor of sensation the announcement would prove on the market. Furthermore, so well has the combined exports to these two countries named been absorbed, that on June 15, 1895, the total stocks of American copper reported in public warehouses in England and France amounted to but 4128 tons, or only 426 tons more than on June 15, 1894.

With consumption both at home and abroad increasing, and demand growing through expansion in electrical and other departments requiring copper, the expectation of better trade, together with a higher level of values, may well become a settled conviction.

Exports of copper from the United States in June will be in the vicinity of 8000 tons, but a falling off in shipments may be looked for hereafter, as the large quantities due on contracts to American consumers will necessitate keeping the more copper here. Prominent shippers say very emphatically that later on this country cannot spare as much copper for export as went abroad last month.

The market for copper closes very firm at 10.62½ to 10.75 for Lake, 10.45 to 10.50 for electrolytic, and 10¼ for the standard quality of casting copper. Electrolytic especially is in scarce supply, and reported so well sold up that orders for delivery in July could not be filled.

New York Metal Market.

NEW YORK, July 11.—PIG IRON—Scotch, 19@20c; American, 12@14c.

COPPER—Brokers', 10.50@10.65c; exchange, 10.80c.

LEAD—Brokers', $3.15; exchange, $3.30.

TIN—Straits, 14.25@14.50c.

SPELTER—Domestic, $3.70.

New York Silver Prices.

NEW YORK, July 3.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30½	66⅞	10 65	.....
Saturday	30⅝	67	10 65	3 12½
Monday	30⅝	67⅛	.....	3 12½
Tuesday	30⅝	67⅛	.....	.....
Wednesday	30⅝	67	10 65	3 12½
Thursday	30⅝	67	.....	.....

The local hullion, money and exchauge quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alpha Con, Nev	14	5c	May 23, Jun 27, July 18	C E Elliott, 309 Montgomery
Best & Belcher M Co, Nev	58	25c	June 12, July 18, Aug 10	M Jaffe, 309 Montgomery
Bullion M Co, Nev	45	10c	June 12, July 17, Aug 7	R R Grayson, 331 Pine
Challenge Con M Co, Nev	19	5c	June 11, July 16, Aug 6	C L McCoy, Mills Building, City
Gold Bar Cons M Co., Cal	1	2c	May 24, Jun 29, July 22	E C Godfrey, Crocker Building
Gould & Curry, Nev	76	15c	July 2, Aug 6, Aug 28	A K Durhrow, 309 Montgomery
Hale and Norcross M Co	107	20c	M»y 29, July 3, July 25	A B Thompson, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19, May 31, July 26	J Henry Smith, 331 California
Occidental Con M Co. Nev	19	10c	June 25, July 30, Aug 21	A K Durhrow, 309 Montgomery
Potosi M Co, Nev	44	25c	July 14, Aug 14, Sept 4	C E Elliott, 309 Montgomery
Sonora Extended M Co, Cal	2	2½c	June 1, July 6, July 27	C A Stratton, 213 Jackson
Union Con	51	20c	June 18, July 19, Aug 15	A P Swain, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Union Cons M Co, Nev	A P Swain, 309 Montgomery	July 15
Yellow Jacket, Nev	W H Blauvelt, Mills Building	July 15

New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.883¼
London Merchants	$4.87½
London Sight Bankers	$4.89¾
Refined Silver, per ounce	67c
Mexican Dollars, nominal	54c

San Francisco Metal Market.

ANTIMONY.			
Per lb	—	@	10
COPPER.			
Bolt	¼ & 5-16, 17c; ⅜ and larger, 16c		
Lake Superior Sheathing	18	@	—
Ingot, johbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
QUICKSILVER.			
Home trade, per flask	41 00	@	— —

Mining Share Market.

SAN FRANCISCO, July 11, 1895.

Since the resumption of business in the Stock Exchanges after the Fourth prices have been firmer. The beginuing of work on the Brunswick lode has stiffened all the Comstocks, Occidental showing particular strength. The Occidental mine, which has been worked more or less regularly for nearly thirty years, and which is still being very successfully worked, is on the Brunswick lode, and it is the only mine on the lode that has ever heen opened and worked in accordance with moderu methods. It has yielded over a million dollars. The late Senator Fair, who once controlled it, had a high opinion of its value, and held on to it long after he had parted with most of his other mining interests on the Comstock. He was always of the opinion that there was something in the mine that was of far greater value than any of the ore hodies that had yet heen found. He did not know where the suspected wealth lay, nor in what shape it would be found, but his mining instinct suggested that the mine was a valuable one.

The following illustrates the changes of the week:

Mines.	1	11
	$ 08	$ 10
Alta Consolidated	16	.....
Andes	27	.....
Belcher	38	37
Best & Belcher	52	64
Bodie	27	.....
Bullion	.....	11
Challenge	.....	.....
Chollar	58	73
Confidence	.....	.....
Consolidated California and Virginia	2 45	2 55
Consolidated New York	.....	.....
Crown Point	38	.....
Exchequer	.....	.....
Gould & Curry	28	43
Hale & Norcross	1 10	1 50
Justice	12	12
Mexican	64	70
Ophir	1 40	1 55
Overman	19	22
Potosi	35	46
Savage	39	51
Sierra Nevada	60	63
Union	31	38
Utah	.....	05
Yellow Jacket	39	.....

San Francisco Stock Board Sales.

SAN FRANCISCO, July 11, 1895.

9:30 A. M. SESSION.

100 Alpha	10	200 Overman	22
200 Best & Belcher	64	300 Potosi	45
200 Bullion	11	300	46
150 Chollar	73	200 Savage	51
100 Con Cal & Va	2 85	200 S B & M	13
200 Gould & Curry	43	300 Union	38
800 H & N	1 50	100 Utah	05

SECOND SESSION—2:30 P. M.

200 Best & Belcher	61	100 Mexican	70
150 Bullion	11	200 Ophir	1 55
300 Belcher	37	200	1 50
100 Con Cal & Va	2 85	200 Occidental	26
200 Gould & Curry	41	150 Potosi	43
500	42	100 Savage	48
200 Chollar	71	200 Sierra Nevada	63
100 Hale & Norcross	1 45	100 Utah	05
200 Justice	12	200 Union	36

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from E. C. Kendall et al., in the Sharp Mine, near Brandy City, Sierra Co., to impound tailings in Sharp Ravine, an old pit, and on the bank of the north fork of the Yuba River; from W. R. Atkinson et al., in the Homestake Mine, near Gold Lake, Sierra Co., to impound tailings in a ravine; from Toland & Laugdon, in the Corkscrew Placer Mine, near Spanish Ranch, Plumas Co., to impound tailings in ravine below the mine and on bank of Spanish Creek; from Henry Goering, in the Last Chance Mine, near Gold Lake, Sierra Co., to impound tailings in a dry ravine; from James Chapelain, in the Chapelain Quartz Mine, near Bakerhy, Yuba Co., to deposit tailings in Honcut Creek; from Luigi Lagomacini, in the Roomie Mine, near Loganville, Sierra Co., to impound tailings in an old pit; from T. T. Kirkham, in the Big Ravine Mine, near Blue Tent, Nevada Co., to impound tailings in ravine below the mine; from the Interior Development Co., in the Brown Placer Mine, near Michigan Bar, Sacramento Co., to impound tailings on flat ground near Arkansas Creek; and from the Cascade Water and Mining Co., in the Cascade Mine, Beckwourth Tp., Plumas Co., to impound tailings in Grizzly Creek, gives notice that a meeting will be held at Room 82, Flood building, San Francisco, Cal., July 29th, 1895, at 1:30 P. M.

Assessment Notices.

CHALLENGE CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the eleventh day of June, 1895, an assessment (No. 19) of Five (5c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room 35, third floor, Mills building, corner Bush and Montgomery streets, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the sixteenth day of July, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the sixth day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

C. L. McCOY, Secretary.

Office—Room 35, third floor, Mills building, corner Bush and Montgomery streets, San Francisco, Cal.

BULLION MINING COMPANY.—Location of principal place of husiuess, San Francisco, California; location of works, Virginia District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the twelfth day of June, 1895, an assessment (No. 45) of Ten (10c) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 20, No. 331 Pine street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the seventeenth day of July, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on WEDNESDAY, the seventh day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expeuses of sale. By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office—Room 20, No. 331 Pine St., San Francisco, Cal.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of husiuess, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 25th day of June, 1895, an assessment (No. 19) of 10 cents per share was levied upon the capital stock of the corporatiou, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of July, 1895, will he delinquent, and advertised for sale at puolic auction, and unless payment is made before, will be sold on WEDNESDAY, the 21st day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

GOULD AND CURRY SILVER MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees, held on the secoud (2d) day of July, 1895, an assessment (No. 76) of Fifteen (15c) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Sixth (6th) day of August, 1895, will he delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the Twenty-eighth (28th) day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expeuses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, Califoruia.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California; location of works, Inyo, Inyo County, Califoruia.

Notice is hereby given, that at a meeting of the Board of Directors held on the 8th day of July, 1895, an assessment (No. 27) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 12, rotuuda, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 8th day of August, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 4th day of September, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

W. W. SARGEANT, Secretary.

Office—Room 12, rotunda, Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

GOLD BAR CONSOLIDATED COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 24th day of May, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
John E. Todd	5	2,500	$ 50 00
John E. Todd	6	2,500	50 00
John E. Todd	9	2,500	50 00
John E. Todd	55	2,500	50 00
Jas. P. McCarthy	13	625	12 50
Jas. P. McCarthy	63	2,500	50 00
Jas. P. McCarthy	64	2,500	50 00
Jas. P. McCarthy	65	2,500	50 00
Jas. P. McCarthy	66	2,500	50 00
W. A. H. Connors	14	625	12 50
W. A. H. Connors	52	1,800	36 00
John H. Page, Trustee	22	500	10 00
John H. Page, Trustee	23	500	10 00
John H. Page, Trustee	24	9,000	180 00
C. A. Moore, Trustee	28	5	10 00
C. A. Moore, Trustee	29	4,995	99 90
C. A. Moore, Trustee	32	16,666	333 32
I. N. Pattisou	53	1,000	20 00
J. S. Herrou	41	300	6 00
E. C. Godfrey, Trustee	74	6,000	120 00
E. C. Godfrey, Trustee	57	1,000	20 00
E. C. Godfrey, Trustee	58	500	10 00
E. C. Godfrey, Trustee	59	500	10 00
E. C. Godfrey, Trustee	60	200	4 00
E. C. Godfrey, Trustee	85	2,500	50 00
E. C. Godfrey, Trustee	86	4,000	80 00
Louise V. Rugg	36	10,000	200 00
A. U. Rugg	33	16,667	333 34
F. R. Harris	42	1,000	20 00
F. R. Harris	43	1,000	20 00
F. R. Harris	44	1,000	20 00
F. R. Harris	45	1,000	20 00

And in accordauce with law, and an order from the Board of Directors, made on the 24th day of May, 1895, so many shares of each parcel of such Stock as may be necessary will be sold at public auctiou at the office of the Company, Room 37, Crocker Building, corner Montgomery and Market streets, San Francisco, California, on Monday, the 22nd day of July, 1895, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessmeut thereon, together with costs of advertising and expenses of sale.

E. C. GODFREY, Secretary.

Office—37 Crocker Building, San Francisco, California.

DELINQUENT SALE NOTICE.

H. P. TAYLOR MINING COMPANY.—Location of principal of business, San Francisco, California. Location of works, Liberty Mining District, Siskiyou county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 19th day of April, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
William Patterson	7	12,492	$499 68
Howard P. Taylor, Jr.	8	12,493	499 72
J. Henry Smith	9	12,492	499 68
Howard P. Taylor, Jr., Trustee 10		12,498	499 92

And in accordance with law and an order from the Board of Directors made on the 19th day of April, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 39 Merchants' Exchange, 431 California street, San Francisco, California, on FRIDAY, the 26th day of July, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. HENRY SMITH, Secretary.

Office, Room 39 Merchants' Exchange, No. 431 California street, San Francisco, California.

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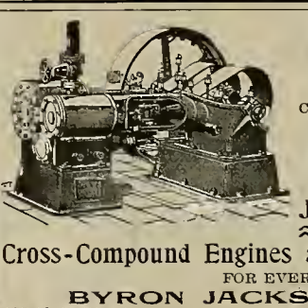
DIVIDEND NOTICE.

The German Savings and Loan Society,

526 California Street.

For the half year ending June 30, 1895, a dividend has been declared at the rate of four and eight-tenths (4 8-10) per cent per annum on Term Deposits, and four (4) per cent per annum on Ordinary Deposits, free of taxes, payable on and after MONDAY, July 1st, 1895.

GEO. TOURNY, Secretary.



WRITE FOR CATALOGUE NO. 15.



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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING JULY 2, 1895.

541,913.—PIANO—A. N. Adams, Stockton, Cal.
541,828.—TIME REGULATOR—W. A. Beebe, King City, Cal.
541,832.—CAMERA—Max Boelio, Los Angeles, Cal.
541,920.—HORSESHOEING MACHINE—S. Cunningham, Sacramento, Cal.
541,926.—CALL BELL—Evans & Tomkin, S. F.
542,087.—CRUSHING MILL—Lightner & Nowsom, S. F.
542,088.—BRAKE LEVER—W. H. Musterman, Oakland, Cal.
542,089.—CAR BRAKE—W. H. Musterman, Oakland, Cal
541,872.—COT BOTTOM—B. F. Neely, Colton, Cal.
542,099.—GRINDING APPARATUS—Nichols & Bloomhoart, S. F.
542,203.—BUILDINGS—J. C. Pelton Jr., S. F.
542,204.—BUILDINGS—J. C. Pelton Jr., S. F.
542,105.—ELECTRIC RAILWAY—L. C. Pressley, S. F.
542,029.—SPRINKLER STAND—N. L. Rigby, Los Angeles, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

METALLIC TILE ROOFING.—Wilhelm Hille, Alameda, Cal. No. 540,913. Dated June 11, 1895. This invention relates to that class of metallic roofing in which sheets of metal, usually in the form of galvanized iron, are laid together with suitable joints and form a waterproof coverlag for all portions of the roof. The inventiou consists in the particular and novel construction and arrangement of the sheets of metal forming the roofing, the means by which they are secured in place, and the joints by which they are connected. The objects of the invention are to provide a metallic roofing of the tile form, adapted to be secured to the board plates by means which are both concealed and are protected from the rain, and to unite the plates of which the roofing is composed by means of joints of such a character that while they afford full connection they are also waterproof.

GRINDING APPARATUS.—W. F. Nichols and B. Bloomhart, San Francisco, Cal. No. 542,099. Dated July 2, 1895. This device, though it can be used for grinding various tools or implements, is especially intended for sharpening shears, to which use it is particularly applicable, as it holds the shears' blade accurately at the proper angle, and guides its edge equally throughout its length, and this without the exercise of any skill on the part of the operator, thus enabling any one—barbers, tailors and the like—to sharpen shears when needed without delay or expense. The apparatus consists of a hopper adapted to contain water, a shaft removably mounted in the hopper, a clamp carried by the removable shaft, pivots about which the clamp is turnable, a longitudinally slidable rotary shaft mounted upon the hopper and a grinding wheel carried by said slidable shaft. The shears are held in the clamp by the several movements of which the blade can be adjusted to the proper angle on the stone, and this angle may be preserved by tightening up the clamp. The stone is then moved sidewnys back and forth over the whole length of the blade as the grinding proceeds.

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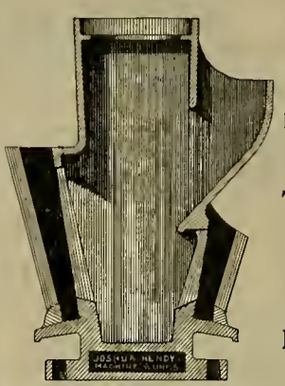
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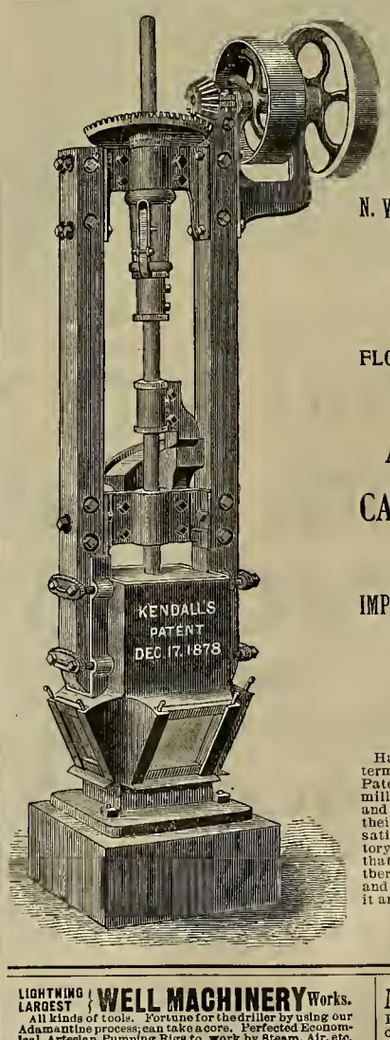
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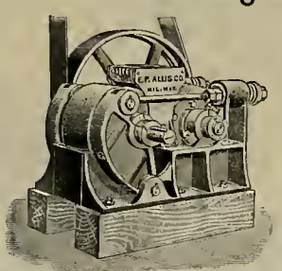
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VOLUME LXXI. Number 3. SAN FRANCISCO, SATURDAY, JULY 20, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

A Pneumatic Boat.



Among recent novelties is an ingenious craft designed by H. D. Layman, 853 Broadway, New York, which is receiving extended notice. It is described by its manufacturer as a pneumatic boat, made of rubber cloth, and shaped like a horse collar. From the forward part of the bottom depend two boots, or leg cases, the ends of which are provided with collapsing paddles, which open on the back stroke and close on the forward stroke, like a duck's foot. The small end of the oval is the bow, and a stiff rudder strapped in one position to the stern keeps the bow in front. The boat is prepared for use by inflating it with air by means of a blower. It takes from three to five minutes to get it ready. The boatman puts his feet into the cases, and, holding up the boat by the loops, he walks down to the water and launches himself. It is claimed there is no danger of capsizing, as the center of gravity is always below the water line. The user of this strange craft may paddle himself in any direction at the rate of two or three miles an hour. Ladies and children may use it with safety in calm water.





One of the accompanying illustrations shows a family party on Narragansett bay, fishing from these boats. This picture was made from a photograph taken from life. The other cut shows a passage through Hell Gate, East river, which was made without difficulty by a party, including a woman.

The boat seems to possess practical value. The arms and body of the occupant are free for the use of gun or rod, and in moving about there is no noise or splash. In rough weather and water a rubber storm cape can be used, which is fastened under the breakwater by a cord. Speed is not a factor, but two or three miles an hour can be attained. The adult boat measures 44 inches long by 34 inches in breadth, and will draw from two to five inches, according to weight imposed; when collapsed, it weighs about fifteen pounds, and can be folded and packed in a valise. In yachting it can be used to get to or from large boats in deep water without a tender, and as a life preserver can quickly be made ready for use.







The illustrations convey a good idea of its appearance and designed use.

From the Melbourne Department of Mines is received a special report by H. Rosales on the "loss of gold in the reduction of auriferous vein stone," which in quality and appearance is superior to former reports from that quarter. It is an account of an inspection of the appliances at the principal Australian mines with a view of securing better methods for saving the fine gold and treating the sulphides—the same problem that is deemed susceptible of solution in other parts of the world. It was estimated that the average loss was two pennyweights of gold per ton, representing a loss of $1,800,000 on the aggregate of '94. Mr. Rosales gives in detail the results of his observations during his visits to the different Australian gold mines and recommends changes in the present methods. In his judgment automatic appliances for the more subdivided separation of coarse and fine sand and slimes will greatly aid in the matter. By eliminating what appears to be advertising reference, and leaving out considerable repetition, the treatise would be of value as a contribution to current literature on this important question.

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J. F. HALLORAN.....General Manager

San Francisco, July 20, 1895.

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COMMENTING on industrial achievements in this city, the Salt Lake *Tribune* calls attention to the fact that men can work more hours in the day, and more days in the year, in San Francisco than in any Eastern State.

THE Secretary of the Treasury places the official value of the Mexican dollar for customs purposes at 52.8 cents for the current quarter. For the quarter ending June 30, it was 47.9. The current local quotation is 54½.

THERE is an unusually large sale of blasting powder by San Francisco manufacturers at present, which is another indication of the great renewal of activity in mining operations. Competition has, however, so reduced the price that there is little profit in the business.

WHEN the first steamship crossed the Atlantic its arrival was simultaneous with the appearance of a learned treatise by a learned pundit proving that it was an impossibility for a vessel propelled by steam power to cross the Atlantic. Coincident with the successful transmission at Sacramento of 80 per cent of the electrical power generated over twenty miles distant, appears a pamphlet written by a well informed man arguing that such transmission is an impossibility. "History repeats itself."

JAPAN shows a desire to buy mining machinery; the Mikado's government has appointed R. P. Forshaw a commissioner to visit England and secure "better interworking between Japanese merchants and others and British manufacturers direct." It is further stated that "all financial arrangements are to be amply secured by the chief Japanese banks." The natural source of supply of Japanese mining appliances is this country, where new and improved forms originate, and, geographically, the United States should and doubtless can successfully compete for desirable business in Japan. The matter is worthy of immediate and earnest attention.

THE success of the Folsom power transmission by which electrical power generated twenty miles from the California capital is delivered in that city is a scientific event of surpassing interest to the industries of the State. The distance is so unusual and the scale so great that some doubt was felt as to the result, but now that it is an assured reality it is apparent that the same thing can be done in other parts of the State, in several instances revolutionizing existing methods. It has been stated in the daily press during the week that the entire plant of the Folsom Water Power Co. has been turned over to the State. The power house at Folsom, the dam and the canal belong to the company. The power house and plant at the State prison belong to the State. The State gets the use of the first five feet fall of the water—an estimated 1000-horse power. The expense involved in this undertaking is considerably over half a million dollars, a large part of which represents the share of the General Electric Company, which supplied the electric appliances on the correct assumption that skill and energy would ensure commensurate return on the outlay.

APART from the satisfactory success of the Folsom electrical transmission scheme, there is additional cause for congratulation in the fact that it will encourage similar enterprises all over the State and coast. It has been viewed by many as an experiment; the demonstration of its ability to do all claimed for it, and more, will be of general value to the industries of the coast. The largest electric power plant in the world for running machinery at a distance is now in successful operation at Folsom in this State, transmitting power over twenty miles. The Niagara power is carried seven miles. Tesla is quoted in a New York paper as saying that he has perfected a means of successfully conducting the power from Niagara to New Orleans. While this is probably an exaggerated report of what that eminent electrician said, yet it is manifest that the twenty miles from Folsom to Sacramento is not the limit of successful transmission of electric power.

THE figures for '94 show that about $14,000,000 less in silver was produced in '94 than in '93. The fact that it was not $40,000,000, or some amount considerably greater than $14,000,000, is commented upon by some of our Eastern friends as showing that, after all, their statements about "cheap silver" are so, and that silver can be profitably produced at sixty cents an ounce or less. They argue that if the claim of the silver miners that silver can not be produced for less than $1 per ounce was so, the shrinkage in the price of silver would have cut down the silver output of '94 much more than it did. Their point of view needs adjusting. The figures for '94 don't give correct data to judge fairly. Many a mine yielded silver in '94 that had been developed a year before, all ready to mine and mill; it was a matter of knowledge just how much could be got out; the most costly part of the work had been paid for. But as fast as those developed ore bodies were mined and milled there was no further development work done; the reserves being exhausted. the stamps were hung up. The real comparison is to be made by this year. When the silver yield of '95 is made up our Eastern friends will readjust their parallax and, probably, understand this matter a little better. The decrease in '95 from '93, or even '94, will be a striking object lesson. Nothing will have so great an effect on the price of silver as the cold logic of the figures that will be published about six months from now on this subject. Of course, the exact official figures showing the precise silver yield of '95 cannot be given out for nearly a year yet, but approximately there will be a close estimate, shortly after the close of the year, that will give silver an upward tendency.

THERE is an apparent lack of interest in the work of protecting the mineral lands of the State from being absorbed by the S. P. and other railroad corporations, among the men most directly interested—the miners themselves. The committee that has this matter in hand is doing all it can, but apathy and indifference in many of the mining counties tend to neutralize their efforts. This is a question that affects the miner and prospector. If the mineral lands of the State are to be tied up in the manner contemplated by corporate action it will limit the area in which prospecting can be done, which is none too large now, and will limit the demand for men, machinery and supplies. It is a question of serious consideration to every one in any way connected with the mining industry of the State, the prospector, the manufacturer, the miner, the mine owner, the merchant, the professional man, all whose business in any way depends upon the active development of the mines. Whether quartz or hydraulic mines, the matter is of equal importance, for what affects one, affects all. Speciously worded letters are appearing in several journals in the State, often with favorable editorial comment, the purport being to lull the miner into false security. Activity is needed in the county branches of the State Miners' Association; the committee is in immediate need of money to successfully carry on the work entrusted to it last November, and which has been energetically pushed, and if the 14,000 miners of California realize the need of immediate response in this matter much can be accomplished that otherwise must go undone. The PRESS has had so much to say on this subject that at times it may seem tiresome to some of our readers, but it is the most important matter before the miners of California to-day, and this paper is only doing its duty in directing attention to the situation. There is grave danger that official zeal in the department offices at Washington, and skilled activity on the part of the railroad people will thwart public justice, but the gravest feature of the situation is the indifference and apathy with which many, who through self-interest alone should be alert, seem to view the trend of events.

Debris Commission's Report.

The report of the California Debris Commission for the year ending June 30, '95, is a terse business document, devoid of opinion or theory; full of facts and briefly reciting the operations of the organization for the past year, showing that the provisions of the bill creating the commission have been justly and faithfully followed. Since its organization there have been 139 applications received for permission to reopen or operate hydraulic mines, of which 69 per cent has been granted. Of those so granted a few have been canceled and others temporarily suspended because of failure or neglect to comply with the requirements under which the permit was granted. The report estimates that the total amount of material mined under the granted permits for the nine months from October 1st, '94, to June 1st, '95, is 900,000 cubic yards; that there is available storage provided for 5,000,000 cubic yards. Regarding river improvement, the report speaks as follows, which is a subject for further discussion:

The conditions on the Yuba river, near Marysville, do not appear to have materially changed, but what change has occurred appears to be for the better. The causes for this are doubtless the cessation in the flow of detritus into the river and the improved conditions at the mouth caused by the outlet made by the Government two years ago. No work looking to the retention of detritus by bank protection has been done, except some preparatory surveying.

A recent survey of the Feather river shows that exceptionally good water exists for five miles below the mouth of the Bear, indicating that the Feather is at present able to carry off whatever detritus is brought into it by the Bear, and no works for the retention of detritus in the Bear need be now considered. The effect on the general system of detritus of the Bear and from the American cannot well be determined without more information than is now available. Surveys and examination will be necessary.

The two most frequently urged plans for the general storage of detritus are the storage behind permanent dams in the river canyons and in the tule land of the Sacramento valley. It is believed in both cases the cost would be prohibitory. As to the first case, assuming that the cost of the dams should be paid from the profits of the mines concerned, it is to be noted that thus far no owners of mines or groups of mines have asked authority to build permanent dams in the larger canyons, though temporary dams and dams of doubtful permanence have been proposed. The strongest apparent reason for this is that owners do not consider that the profits of the mines would justify the expense of constructing dams.

Of the tule land project, one that has been most prominently urged is that of storing in the American basin on the east side of the Sacramento river just north of the American river and extending up the Sacramento and Feather to the Bear. A project of diverting the Bear and Yuba into this basin was advocated in the last annual report.

The Commissioner of Public Works for California estimates that such a diversion of the Bear and Yuba would involve the purchase of from 75,000 to 100,000 acres of land; the building of a levee on at least two sides of the basin; thirty miles of leveeing of diverted streams on at least one side; twenty miles more of building of costly diverting dams and excavation of extensive channels. Add to these the necessity of crossing large creeks and railroads, it will be seen that the project involves items of expense of such a magnitude that if the scheme is not impracticable on its face, its feasibility can only be determined after careful estimates based upon detailed surveys.

While the commission does not believe any of these plans to be economical and practicable, it is unable from lack of data to state even approximately the cost involved.

Concentrates.

THE pay roll for the Cariboo, B. C., for June was $30,105.

DURING 1894 Chinese in Placer county mined $341,560 with pan and rocker.

THE reported sale of the Pioneer mine at Grass Flat is denied by Supt. Deisoa.

THE North Pole Mining Co. at Boise, Or., will have H. Leipman manage its affairs after August 1st.

THE Trade Dollar, at Silver City, Idaho, ships $50,000 per month in bullion, besides several carloads of rich concentrates.

THE Gold Dredging Company, of Red Rock, Montana, has what is said to be the first electric elevator dredge ever built.

THE Cleghorn Bar mine, middle fork of Feather river, Plumas Co., is to be equipped with suitable machinery and worked.

THE Juneau *Searchlight* says: Lytton Taylor, United States Attorney for Alaska, has resigned to go into the mining business.

THE Alaska-Treadwell Mining Company of Alaska, has declared a quarterly dividend of 37½ cents per share, payable July 29th.

THE Grass Valley *Union* says that I. M. Taylor, the recent purchaser of the Plumbago mine, will have a ten-stamp mill erected immediately.

THE English company which recently bought the Blue Gouge mine, Pleasant Valley, El Dorado Co., proposes to erect a 40-stamp mill.

THERE is renewed activity in the Mammoth district. A 10-stamp mill is building, and preparations making to work some of the mines there.

EX-GOV. BLAISDELL of Nevada, who recently bonded the Maple mine, Canyon Creek, Trinity Co., is having an examination made of the property.

THE Sierra *Leader* is publishing a series of interesting articles on the gold gravel deposits of Sierra county, written by L. D. Davis of Downieville.

UNITED STATES coinage during the fiscal year ending June 30, '95, is as follows: Gold, $43,933,475; silver, $9,069,480; minor coins, $717,594; total, $53,715,549.

BELGIANS, representing $2,500,000, have T. Vandervecken examining Tuolumne county properties this month with intent to invest if reports are favorable.

THE Bullion-Beck (Utah), which declared a $100,000 dividend June 29, declared a $50,000 dividend last Monday, making nearly $2,000,000 paid by that mine.

IT is figured up that for the year ending Dec. 31, '94, Calaveras county was first in California in yield of gold, Placer second, Nevada third, Amador fourth.

THE work of cleaning up the Holmes Mining Company's mills at Belleville and at the Candelaria mill, Nevada, under the Peck contract begins next Monday.

THE executive committee of the California State Miners' Association will hold a meeting at the Palace Hotel in this city at 8 P. M. next Monday, the 22nd inst.

THE Crown Point, Hidden Treasure and White Swan mines, Rossland, B. C., have been bonded to A. E. Humphries, of Duluth, for $75,000; 5 per cent was paid down.

ONE-HALF INTEREST in the Lost Horse mine was sold at San Bernardino last week by G. S. Lines to Capt. Ryan, for $25,000. It is located four miles east and south of the McHaney mines.

MR. SWAIN, representing Baker & Hamilton who recently bought the Confidence mine, fourteen miles from Sonora, Cal., figures on spending $40,000 in machinery and improvements thereon.

HAD the ferry at Northport not broken down, it is estimated that shipments of ore from Trail creek in June would have exceeded 3,000 tons, the value of which would have been over $100,000.

THE first electric hoist placed in the mines of Butte, Montana, was installed last Tuesday at the Virginius—a 50 H. P. There is a large one at the Alta mine, Wickes, Montana, and another at the Poorman, Idaho.

THE Oro Plata Gravel Mining Company has incorporated in this city. Capital stock, $100,000; J. P. O'Brien, C. H. Phillips, H. W. Van Dervaart, W. P. Anson of San Francisco and John Finlay of Alameda, directors.

TWO "expert prospectors from Arizona" are said to have discovered gold galore ten miles from Vallejo, and in two days this week, with a rocker, produced $459 in coarse gold. The statement lacks some elements of fact.

A YEAR ago stock in the Boleo Company, operating mines at Santa Rosalia, Baja California, was quoted at 250 francs per share. It is now 1250. The company is putting in an electric plant for lighting and running all their machinery.

DR. MIDOWIEZ of the Original Quartz Hill Gold Mining Co., of Quartz Hill, Shasta Co., is about to enlarge the mill from 10 to 20 stamps. The doctor, who is president of the company, is now his own superintendent and manager.

W. A. CLARK, the millionaire mine owner, has disposed of his mining interests in Montana to the Anaconda Company. He will remove to Arizona and devote his time to his mining interests there. This statement is denied by Marcus Daly.

A GOLD BRICK worth $2,300, the result of a week's run at the Hart mine, Shasta Co., was lost from a buggy in transit from the mine eight miles to Redding last Saturday and fortunately found almost immediately by a man who promptly returned it.

GEO. D. Burton, a New York electrician, is here with an electric process which he says will extract everything of value in the most rebellious ore at small cost. He proposes to make practical showing of his ideas and may modify his views on this subject.

OF the Trail Creek, B. C., country an American prospector says: "No one here can open a saloon without it has a hotel attachment; no one is allowed to carry a pistol; they may fight with their fists all they please, but any threats of shooting or knifing result in the roughs having their miner's right cancelled and being sent 'over the road,' which means something else occasionally besides being given the usual twenty-four hours in which to leave camp."

THE Nevada *Transcript* says the Champion Mining Co. will build another quartz mill of 40 stamps on the ground purchased of the Wyoming Co., to be used exclusively for crushing ore from the Wyoming. That will give the Champion 70 stamps altogether.

AT Prescott, Arizona, the Arizona Gold Mining and Development Company—J. C. Herndon, J. J. Hawkins and G. B. Semmmeli incorporators—have filed articles. The capital stock of the corporation is placed at $2,000,000 and its indebtedness limited to $100,000.

THE Boston and Montana Copper Co., is now reported earning $125,000 per month, equivalent to $12 a share annually. During May the Atlantic Mining Co., produced 424,187 pounds refined copper. The Anaconda expects its output for '95 to aggregate 100,000,000 pounds.

AT Calumet, Mich., work has begun on No. 5 shaft of the Tamarack mine. It is stated that the shaft will extend vertically almost one mile into the earth before striking the copper lead. It will require four years, working day and night with dynamite, to reach the vein.

DURING the first half of '95 Great Britain shipped to India silver to the value of £1,992,380; to China, £1,100,767; to the Straits, £390,803, a total of £3,483,950. For the corresponding period of '95 the similar shipments aggregated £5,275,521, a decrease so far this year of £1,791,571.

A SACRAMENTO dispatch of the 17th says the executive committee of the State Anti-Debris Association met there the day previous. Reports were made as to movements of watchmen in the mines during the month past, and matters connected with the North Bloomfield suit were discussed.

AT the Alaska-Treadwell operations in June aggregated shipments of $87,697 from 25,991 tons ore milled; tons of sulphurets treated, 398, yielding $28,873. The gross expenses for the month were $22,064. This is the largest monthly bullion shipment and the largest net return in the history of the mine.

DAY & FRENCH, who had the Goldea Chariot and Jesse mines bonded, have bought the property for $9,500. The mines are in a ledge parallel to the Santa Rosa, and seven miles from Perris, Riverside Co. The new owners will, it is stated, put up a 10-stamp mill. The shaft is down 200 feet and will be sunk 40 more.

THE Pioneer mine, Placer county, formerly owned by the Fair estate, which has given employment to nearly 100 men, will be worked on a large scale by the Boston people who recently bought it. A tunnel is being driven 500 feet below the former workings, to strike the ledge at that depth. J. J. Sullivan is the superintendent.

THE Iron Mountain Railway Co., has incorporated with $100,000 capital stock, all subscribed, to build a steam or electric road from the Iron Mountain mine, Shasta Co., to Spring Creek on the California and Oregon division of the S. P. Co.'s lines, 13½ miles, and a four mile branch to Copley. The directors are Messrs. Fellows, Fielding, O'Shaughnessy, Parrott and Eels. The two former are residents of England, the three latter live in this city.

THE statement is going around that figures for '94 show that the United States is third on the list in the amount of gold produced, Africa first and Australia second. It is worth bearing in mind, however, that accurate statistics show that in '94 the United States produced the most gold of any country in the world, and California produced the most gold of any State in the Union. In '94 the gold yield of this country aggregated in value $39,780,962; that of all Africa, $39,546,984; Australasia, $38,478,874.

THE *Enterprise* says the point on the Brunswick lode selected for the commencement of work by the Chollar and Potosi mining companies is midway between the Chollar north line and the center of the Hale & Norcross ground. It is the most convenient place to get at, and as favorable in appearance as any. This brings it but a short distance north of a prominent outcrop of the St. John ground, from which ore has been extracted in days gone by, and from which samples can now be taken running from $2 to $25 per ton.

THE following, furnished by the Tacoma, Wash., Chamber of Commerce, is a statement of the Tacoma smelter for the month of June, 1895: Product—2200 bars bullion, weighing 225,600 pounds; copper matte, 71,800 pounds, containing 1,263.80 ounces gold, at $20.67, $26,123.98; 25,456.09 ounces silver, at .67, $17,055.58; 233,857 pounds lead, at .03⅛, $7,308.03; 23,315 pounds copper, at .09½, $2,214.92; total product, $52,702.51. Number of men employed, 62; pay roll, $4,542.86; wood choppers and teams, $922; total operating expenses, $5,464.86.

THE Idaho Gold Mining and Smelting Company, capital stock $500,000, incorporated this week at Butte, Montana, "to develop the Idaho claims on the Trail creek division of the West Kootenay mining district in British Columbia." The incorporators are O. Durant, of Culpepper, Va.; A. H. Tarbet, of New York city, and P. A. Largey, G. Lavell and W. G. Benham, of Butte. The same parties also incorporated the Center Star Mining and Smelting Company for the purpose of developing the Center Star mine in the same district. That company is also capitalized for $500,000.

THE Big Horn Gold Mining Co. has incorporated in Los Angeles. Capital stock $2,000,000, of which $1,438,000 is alleged to be subscribed. The directors include L. W. Blinn, president, Judge E. M. Ross and Senator White. The mine is located at the headwaters of the San Gabriel river, on the north slope of Mount Baldy, at an altitude of 7500 feet. Reports from the property say the vein is traced for five miles between walls of ledges 50 to 100 feet wide on the surface. Water in the gulch and immediate surroundings will be depended on to develop a 25,000 horse-power. A 100-stamp mill is to be erected by the company.

AFTERMATH of the Cœur d'Alene strikes of '93 comes in suits against the Helena and Frisco Mining Company aggregating $325,500. Sam'l C. Collis sues for $76,000, alleging that he was employed by the company at their property in Shoshone Co., Idaho, on July 1st, '93, as a miner: worked nine days: on the 10th of that month was ordered into the mill, went under protest, and when the strikers blew up the adjoining mill his spine was jarred and his hearing impaired. The estate of M. I. Halcrow sues for a similar amount. The deceased was injured, it is claimed, fatally, he dying some months after the explosion. T. K. Adams sues for $21,500, being deaf and partly blind from the explosion. Other damage suits were also begun, all in the U. S. District Court in this city. The company will contest the claims.

THE Rossland, B. C., *Miner*, declares it not an exaggeration to say that the whole belt of country from the head of lower Arrow lake down the Columbia river to the boundary line and west to Okanogan divide is alive with men. From the headwaters of creeks which fall into Arrow lake on the west, and from the headwaters of Beaver creek and Salmon river on the east, men are coming into Rossland every day with news of discoveries and recording claims. Many of these discoveries are no doubt valueless, and many of these locations will be abandoned, but the exploration of such a gigantic territory is bound to result in the discovery of some camps.

SOMETIME ago the issuance of aluminum coin by a mining company in Lincoln Co., Nev., was commented on. In reference thereto it is worthy of note that Section 5461, Revised Statutes of the United States, says: "Every person who, except as authorized by law, makes or causes to be made, or utters or passes, or attempts to utter or pass, any coins of gold or silver or other metals, or alloy of metals, intended for the use and purpose of current money, whether in the resemblance of coins of the United States or of foreign countries, or original design, shall be punished by a fine of not more than three thousand dollars, or by imprisonment, not more than five years, or both."

W. D. MURDOCK, assistant general agent of the Mexican Central Railway, says there is a great deal of capital going in from other countries and the resources are being rapidly developed. The fact that Mexico is on a silver basis does not frighten away investors. This country does not do as much business there as it should. In the City of Mexico there are only about half a dozen representative American firms. The exports from Mexico have increased within a year from $12,000,000 to $80,000,000, and new manufactures are starting everywhere. The English are investing very heavily in lands and mining, the French, Germans and Spanish go in for mercantile investments, while the Americans are syndicating on large tracts of land.

THE Bald Mountain Mining Company has been incorporated in Oakland to mine in California and Montana. Capital stock, $1,000,000, of which $806,000 has been subscribed as follows: R. S. Leckie, $40,000; W. H. Lee, $40,000; M. C. Rigney, $40,000; H. Edwards, $8000; G. H. Payne, $40,000; Geo. Chase, $40,000; J. T. Carothers, $40,000; John Thaxton, $40,000; Frank Wallace, $20,000; George E. de Golia, $40,000; W. D. Heaton, $80,000; John Smith, $20,000; Isaac Thaxton, $40,000; David Craig, $20,000; Wm. Winnie, $40,000; W. E. Miller, $20,000; Wm. Dahl, $16,000; W. M. Leete, $40,000; R. A. Cameron, $20,000; J. P. McDonald, $20,000; C. E. Colton, $20,000; Dora Frederick, $32,000; Joseph Harris, $40,000. Directors for the first year: W. D. Heaton, M. C. Rigney, W. H. Lee, John Thaxton and George Chase.

Obituary.

Jas. G. Rule.

One of the most famous miners of the coast died suddenly at his home in this city last Sunday. Few men enjoyed higher reputation as a successful miner than "Jim" Rule. Along with Mackay, Fair, Flood and Jones his name is indissolubly connected with the big bonanza days of the Comstock.

He was a native of Cornwall, England, and came here over forty years ago, working for a while in Yuba county and then drifting over to Nevada, where he was soon recognized as a superior and pushed to the front. He there acquired a reputation for "good luck," which stood by him for nearly thirty years. When Jno. P. Jones started to work the Con. Va., "lucky Jim Rule" was appointed foreman, but he and Jones couldn't agree and he left. Years after, when Pine street was about as badly in need of a little ginger as it is now, Rule declared he knew where there was a big ore body near the south line of the Gould & Curry. He was put there and in a comparatively short time unearthed a good-sized bonanza in the Savage almost exactly where he said it was. Then there was a brisk exaltation of stocks, and his luck was unquestioned. He turned his attention to this State, operated a gold mine in Calaveras Co. and, as usual, did very well. In the mid-summer dullness of '93, when a good many seemed afraid to lend nineteen dollars on a $20 gold piece, and there was nothing doing in stocks, Rule came to the city and told the directors of the Con. Virginia that for nearly twenty years he knew where there was a mass of rich ore in a certain level in that mine. His "luck" and former success impelled the directors to enlist his services; they authorized him to spend $4000 a month for six months, and the famous "Rule drift" was run. Stocks took a spurt, and it looked as though old times had come again; but at the end of the six months there was no bonanza uncovered, and for the first time in his life he failed to make good his prophecies or promises. He quit, and for the past year has been working some Tuolumne mines in which he was interested.

There was probably no man living who could "see into the earth" any farther than Jim Rule, and his memory will live as long as that of the famous mines with which he was so long connected.

A. N. Towne.

A. N. Towne, one of the foremost railroad men of the country, died at his residence on California street, this city on the morning of the 16th inst., in his 66th year. He was a native of Massachusetts, and for forty years an all-around railroad man. Twenty-five years ago he entered the service of the S. P. Co., and at his death was second vice-president and general manager of the entire system at a salary of $25,000 per year. Mr. Towne was a genial man, well liked by all; possessed unusual executive ability and so filled his high position as to command universal respect. He was conciliatory but firm, kept his promises and many times exerted his authority in favor of the numerous employes in whose interests he always had a genuine concern. He was of considerable service to the State in which he lived so long, and did much to advance its interests. He never ran to a fight nor from it and was honest and straightforward in his private friendships and his public duty.

G. F. Deetken.

G. F. Deetken died at his home in Placer county last Monday in the 60th year of his age. He was one of the best known miners in the State, his name being connected with the chlorination process of which he was one of the originators and among the first to make a success of in this State. He was a skilled metallurgist, and his many contributions to this paper have been copied into every mining journal in the world. The deceased was a native of Mosbach, Germany. He came here in 1853 and mined in the neighborhood of Grass Valley. For forty years he followed the business with varying success, spending large sums of money in experiments and improvements. Last August he was instrumental in organizing the Marguerite Gold Mining and Milling Co., which operates near Auburn, and since then has been acting as superintendent there.

The Trail Creek Country.

Written by CLARENCE KING.

Clarence King has spent considerable time in the Trail Creek country, B. C., and in a Chicago paper says that so far the more important mineral discoveries in that region are within British Columbia, but geological identity renders it almost certain that the slower and more thorough prospecting that always follows early discovery, will extend the valuable area well down into the State of Washington.

The points where profitable mines are already open lie within ten miles of the Columbia.

Access to the region is gained by the Canadian Pacific railway, which forms the northern boundary of the mining territory, and the Great Northern and Northern Pacific systems, which skirt its southern margin, besides several hundred miles of navigable waterways, including the Columbia river and its larger tributaries and several important lakes.

The Spokane Falls and Northern railroad enters the region from the south. In spite of all these avenues of communication and of several years of active mining development, the region remains in detail a half-known wilderness. In the eastern part of the province both the Selkirks and Rocky mountain range proper ascend to 12,000 feet, culminating in wild peaks covered with perpetual snow, their gorges choked with extensive glaciers, and their flanks covered with all but impenetrable forests.

The summer is short, the winter correspondingly long, and agriculture, except on the coast, is confined to rare sheltered spots and a few northern crops.

Over the British border and into this grim, difficult region American prospectors have poured during the short working season of the past five or six years with all their characteristic energy. In canoes they have threaded every lake and river. With axes they have hewed their way through tall coniferous forests which grew almost as dense as a canebreak. Not a snow ridge is so lofty or inaccessible but these hardy fellows have made their bivouacs by the sides of the glaciers and prospected literally above the clouds.

Although this is British territory, it is curious to note that nearly all the exploration and discovery is being done by American prospectors, and about all the development by American miners. The Columbian profits in various ways, but he stands dazed before the audacity and the knowledge of the mining adventurers from the States.

One who has followed the older districts for years constantly comes across familiar faces in Columbia cabins and by the side of mountain campfires. The same eager, imaginative, dauntless fellow you saw silver hunting a few years ago among the palms of the Mexican Sierras meets you now, toiling along on snowshoes over the low ridges of the north, keen for gold.

Thus far only a general prospecting reconnoisance in force has been accomplished for the whole region south of the Canadian Pacific railway, resulting in the discovery of many valuable and some brilliant mines. But it is already certain that the whole field described is one broad mineralized area. The chief points of demonstrated value are the district of Slocan in the East Kootenai division—where excellent silver-lead mines are being exploited, and where the two metals occur in unusually high percentages in veins, with every evidence of strong extension and permanency—and Trail Creek, in West Kootenai, six miles west of the Columbia and about ten north of the boundary. At both of these points towns are rapidly building and large permanent works of development are begun. It is the mines of Trail Creek, near Rosslaud, which for the moment are attracting the widest public interest from the fact that their veins carry an exceedingly rich and unique type of gold ore.

All these are strung along in a single belt of precious metal deposit, which extends from Alberta to the Pacific. They are the first fruits of the new campaign. Enough is already known to warrant the conclusion that the whole of the province is more or less mineralized.

As mentioned, the Slocan ores carry a higher percentage of lead and silver than those of any district in the United States, and are thus able, in spite of their remoteness, to compete in the smelting market of this country, paying the federal import duty and going as far as Kansas City.

Moreover, their abundance is of great importance, in view of the rapid exhaustion of the rich silver-lead deposits in the States. At the depressed value of silver and panic price of lead Slocan is till able to produce the two metals at a big profit.

The Trail Creek gold mines were discovered four years ago, but their regular development dates from 1893. Their mineralogical character is so peculiar that a few points of technical interest may be mentioned. From the Columbia river eastward extends a chain of ancient outbursts of a dark green, heavy, exceedingly hornblendic diorite, an irruptive rock oftener in other countries associated with occurrences of the precious metals.

These mountain masses of diorite are riven in several directions, but mainly on east and west lines, by a numerous series of fissure veins filled with a massive mixture of iron and copper sulphide carrying from one to three ounces of gold to the ton, from 5 to 10 per cent of copper, and a small varying amount of silver, usually less than ten ounces. The ore consists of pyrite, not often crystallized but usually in a solid, amorphous mass. As developed the vein shows great volume, and solid ore free from gangue and ranging from five to twelve feet in thickness.

When it is added that the ore chimneys, though not very long, are very frequent and near together, it will be realized that here are the elements of a new and extremely rich type of gold formation. Such ores are obviously out of the range of amalgamation processes, but are entirely suited to matting and smelting. The few hundred tons which have thus far been extracted, largely in the course of development, have been smelted in Butte and Helena, whither they go by the Spokane Falls and Northern and Northern Pacific roads. The smelting results show a remarkably uniform yield, which is found to average about $48 in gold and 6 per cent in copper. Nowhere else in America are there large, strong veins of this chemical nature. Such ores were heretofore rather a mineralogical curiosity.

Several admirable mines at Trail have passed the experimental stage, and are now realizing an important production.

Slocan and Trail have given such an impetus that this year's prospectors are extremely active, and already tales of new discovery are coming in from the front, and by autumn the known field will certainly be much extended.

The mining laws and regulations instituted by the provincial government are excellent in their liberality and wise provision. At first they followed our pernicious system and granted with each location extra-lateral rights to follow a vein on its dip under the surface of another proprietor, but they soon saw that it would be wiser to make mining laws for sound title than for the benefit of mining lawyers, and they repealed the act and substituted "square locations," the only safe basis of ownership.

The new towns are exceptionally orderly and decent. All miners are licensed from year to year at a fee of $5, the license being revoked for ill-behavior. An official called the gold commissioner has general oversight of the administrational phase of the mining industry, using his large powers to the great satisfaction of the mine proprietors.

British Columbia is a rich and permanent mining field which will always be chiefly operated by our countrymen. The physical conditions are novel and in some respects trying, but not enough so as to discourage or delay our race of miners, who are at home anywhere from the Yukon to Central America.

Mine Management on the Randt.

Geo. Starr, the manager of the New Primrose, a Johannesburg, South Africa, mine, gives some figures which illustrate the economical method of working gold ore in that region. The following is for the month of May:

MINING.—24,828 TONS.

	Per Ton. Shillings.
Mining	6.534
Developing (hand)	2.164
Developing (machine)	3.149
Pumping and hauling	1.580
Tramming (underground)	0.896
Tramming (surface)	0.229
Maintenance, etc.	0.708
Total	15.260

MILLING.—24,568 TONS.

	Shillings.
Crushing and sorting	0.230
Milling	1.618
Maintenance, etc.	0.166
Total	2.014

CYANIDING.—16,736 TONS.

	Shillings.
Filling and discharging	0.721
Labor	3.053
Maintenance	0.280
Total	4.054

The cyanide expenses are calculated upon the basis of 16,736 tons of tailings treated, being the product of 24,568 tons of ore milled, 30 per cent of the pulp being temporarily lost in slimes. To arrive at the actual cost per ton cyaniding bears to the quantity of ore reduced, the total expense for cyaniding, viz., £3395, is divided by the tonnage crushed, 24,568 tons. This gives a cost of 2.76s per ton. For the month the expenses at the New Primrose were, therefore, as follows:

	Per ton.
Mining	15.260s
Milling	2.014
Cyaniding	2.760
Total	20.034s

DURING the last five years the price of amber has been reduced nearly two-thirds. A new process of melting and molding it into shape has been adopted, where before it was cut from a solid mass. The molded amber is stated to be less brittle and far more durable than the cut amber, and in consequence is in greater demand. By the new process, it is claimed the amber can be molded into any form and there is no waste.

A Just and Dignified Protest.

At a special meeting of the Geographical Society of the Pacific last week the following memorial was ordered sent to the President:

To His Excellency Grover Cleveland, President of the United States:—Among the removals from the United States Coast and Geodetic Survey, just announced, is that of Professor George Davidson, for many years in charge of the Survey on the Pacific Coast.

The Geographical Society of the Pacific desires to enter a respectful protest against this removal. Professor Davidson is physically far more active than his years would lead those not acquainted with him to suppose. He is amply able to do duty in the field to-day, and his long experience and well-earned reputation in scientific circles render his services exceptionally valuable to the Coast Survey. Thoroughly familiar with the routine, he is fully qualified to carry on what yet remains to be done along this coast.

We consider it a grave mistake to remove him. One who could devote night after night to taking stellar observations for the United States Government in a cold, damp observatory, from 9 P. M. to 3 and 4 A. M., keeping this up for periods of sixty and seventy consecutive nights, and transact the daily office business of the Survey besides, as the Professor has frequently done within the past three years, can scarcely be called too old for duty. Many men who are twenty years younger than he is could not go through such a physical strain. In reducing the appropriation for his department Congress did not intend to dispense with his services.

As a recognition of his work for the advancement of science the Royal Geographical Society of London elected him an honorary member of their organization. In 1894 the French Government appointed him a corresponding member of the "Bureau Des Longitudes" of Paris. This honor has never before been conferred upon an officer of the United States Government. In both instances the action was a compliment to the American people.

And this society does, therefore, with a view to the benefit of the public service, respectfully ask that your Excellency take such action as may be necessary to restore Professor Davidson to his former position.

RALPH C. HARRISON,
IRVING M. SCOTT,
CHAS. L. TAYLOR,
JOHN PARTRIDGE, Secretary.

In this regard it is noted that our distinguished fellow citizen is not sitting supinely. He proposes to engage in active work as consulting engineer, and will doubtless have demands upon his services that will compensate, from a financial point of view, for any loss of Government position.

Professor Davidson's studies and work in irrigation projects have been wide. In 1873, he, together with General Alexander and Colonel Mendell, U. S. engineers, were appointed by the President Commissioners of Irrigation for California. They examined the entire Sacramento and San Joaquin valleys, traveling some few thousand miles to all tributary streams and reservoir sites. Their report was published by the Government. In 1875, by direction of the Government, he examined the great irrigation works and projects in India, Egypt and Italy. In India he visited twelve great systems upon the advice of the Viceroy, and brought home a great volume of plans, etc. He has kept himself informed of the progress made since. In Egypt he examined the valley of the Nile from the delta to the first cataract, at the request of the Khedive, who put his steamer and an engineer officer at his disposal. He made an unofficial report to the Khedive and killed some of the projects under discussion. In Italy he examined the great Canal Cavour and the drainage enterprises on the lower Po. His report on these examinations was published by the Government. Upon his return to California he delivered two lectures before the Legislature, at their invitation, upon the application of the principles he had learned to the conditions in this State. For private enterprises he has at various times since given much valuable expert testimony, notably in the "Desert Lands" case, and has made reports on many projects of magnitude, such as the Bear Valley Land and Water Co.'s projects in San Bernardino county, upon which report the money was obtained, and the San Luis Rey Water Co.'s project in San Diego county.

In harbor and river matters he has kept himself informed of the needs and the methods of relief through the necessity of gathering information for the four editions of his "Coast Pilot" of California, Oregon and Washington, and his "Coast Pilot" of Alaska, and knows what success has attended the efforts of the U. S. engineers.

SALARIES on the American liner "St. Louis" are: Master, $5000 a year; first mate, $1500; second mate, $1000; chief engineer, $250 a month; first assistant engineer, $125; second assistant, $100; third assistant, $84; seamen, firemen, waiters, etc., from $18 to $25. The ship's crew numbers 410, of which 200 are in the engineer's department.

The Sultepec Mining District.

TO THE EDITOR:—This district, one of the most important in the State of Mexico, is situated about 100 miles southwest from the City of Mexico, and is reached by the Mexican National R. R. to Toluca, the capital of the State, 45 miles; thence by a branch line to San Juan de las Huertas, 10 miles; and the balance of the distance, 45 miles, over a good pack trail, which will be made into a wagon road during the coming dry season. The chief town is Sultepec, elevation 7700 feet, with a population of about 4000. There is a tri-weekly mail, and telephone and telegraph connection with Toluca and the City of Mexico. In the neighborhood are a great many farms, and in consequence provisions are plentiful and cheap. The hills to the east and south of town are covered with oak and pine trees, suitable for mining timbers, fuel and charcoal. Cord wood is worth form $2.50 to $3.10 per cord, and charcoal from $5 to $5.60 per ton. These and following prices are in Mexican money, now worth a little more than one-half of a like sum in U. S. gold coin. There is a fair supply of good water at all seasons, and during six to eight months the smelters are run by water power.

Labor is abundant and cheap, miners receiving 50 cents and laborers 36 cents for a day of eleven hours. Much of the work is done by contract, at prices running from $5 to $10 per meter for tunnel or drift, and from $7 to $15 for sinking. Tunnels average 2 meters high by 1.75 meters wide; shafts about the same. In all cases the men furnish powder, caps, fuse and light, and handle the rock broken. As a general thing the ground is easy, being for the most part slate, though at times the vein matter is a very hard quartz. The present freight rate to the nearest railway station (San Juan de las Huertas) is $2 per carga of 300 pounds, or $13.65 per ton; but on completion of the wagon road it will be reduced to about $5 per ton. Some heavy freight has been hauled over the trail on wagons, but at considerable loss of time and money, owing to steep grades and sharp curves. The climate is delightful, and there are no mosquitoes or other noxious insects. Mining and smelting have been carried on in this district since before the time of Cortes, and to-day the inhabitants are engaged to a large extent in one or the other industry. In the early part of this century much of the ore was treated by the patio process, and over 800,000 ounces of silver were shipped to the mint in the City of Mexico in the four years and a half from 1803 to 1808. From the date of the independence of Mexico to the early eighties, a period of about sixty years, very little work was done in the district; but within the last ten or twelve years a new impetus has been given to the mining industry by the organizing of four companies, in which American, English and Spanish capital has been invested. These companies are known as the Sultepec Mining Company, the Hidalgo Smelting Company, Las Minas de "El Malacate," and El Fundo Minero de Sultepec. Of these, the first three have water-jacket smelters, with a combined capacity of 140 tons per 24 hours; while the last named makes use of four German stone furnaces, which treat about thirty tons daily. In addition to the plants mentioned, there are five other smelters in the neighborhood, viz.: La Providencia, Diego Sanchez, La Garapata, San Francisco, and Los Arcos. Los Arcos is owned by a German company and has been in continuous and successful operation since 1822.

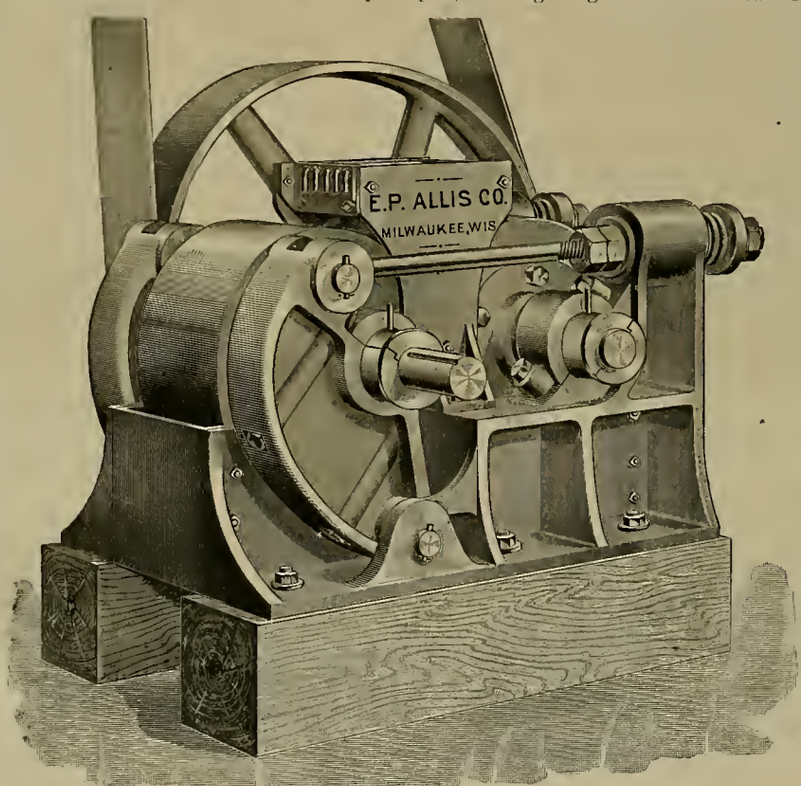
The veins of this district may be divided into two classes, *i. e.*, those carrying galena in a quartz gangue, and those with no galena, but rich in silver, with calcite as gangue. The veins of the former class measure from five to sixty feet in width, with three to twelve feet of pay streak, and run northwest and southeast, and dip to the north at an angle of 50 to 75 degrees. The largest averages fifty feet, and has been worked to a depth of 100 to 300 feet, at intervals of four or five hundred feet, for more than three miles. With the galena are found iron pyrites, arsenical pyrites, blende, antimonial silver and argentite. The average value of the ore in the pay chimneys is 15 to 40 per cent in lead and 30 to 50 ounces in silver per ton; while between the chimneys a part of the lead is replaced by pyrites and the silver contents is reduced by 30 to 50 per cent, thus giving an ore with 5 to 10 per cent in lead and 15 to 25 ounces in silver. This latter grade ore does not pay to smelt under present conditions, and there are thousands of tons left standing, or thrown over the dump. By the erection of a concentrating plant all of this ore could be made available, and on a basis of handling fifty tons per day would yield a net profit of $6 to $8 per ton, or about $100,000 per year. There is now in sight more than enough ore to run for twenty years.

The veins with no galena are by no means so plentiful as those just mentioned, but are richer in silver, running from 50 to 200 ounces per ton. The average width is about a foot and the workings are extensive, though the greatest depth will not exceed 400 feet. As there is a difference in elevation of more than 1500 feet between the highest and lowest points on several veins, most of the work is carried on through tunnels, and at present writing there is not a single hoisting plant in the entire district.

Sultepec, Mexico, July 3, 1895. C.

The Reliance Crushing Rolls.

The accompanying cut illustrates a new type of crushing rolls for crushing ore, as built by The Edw. P. Allis Co., of Milwaukee, Wis., branch office, 9 Fremont street, San Francisco, Cal. The makers claim it is the most compact roll on the market and no other make can compare with it as regards fewness of parts. "The frame is constructed on scientific principles, securing the greatest possible strength with a minimum amount of iron. The journal boxes are made on the ball and socket principle to avoid any unequal strain on the bearings, which is a grave fault with rolls having rigid bearings. The adjustable roll is mounted on a swinging pillow block, the same being pivoted at the bottom and held in place at the top by tension rods, with springs and adjusting nuts as shown. This mode of construction is regarded by the best mill men as being highly advantageous over sliding boxes. The tension of the springs is adjustable, and by means of collar nuts the slapping together of the rolls is prevented."



THE RELIANCE CRUSHING ROLLS.

MEN are composed chiefly of charcoal and water. As beings of this composition cannot exist in any heat great enough to set the charcoal on fire in spite of the water, the scientists are now speculating as to the possibilities of the hot stars being inhabited by animals with silicon substituted for charcoal. Silicon is sand, or at least it bears much the same relation to sand that carbon does to charcoal.

THE longest American railroad tunnel is the Hoosac tunnel, on the Fitchburg Railroad, four and three-quarters miles. The St. Gothard tunnel in Europe is over nine miles long.

IT is estimated that over a quarter of a million workmen have benefited by the recent increase in wages. The average advance is about 12 per cent.

A LARGE aluminum plant has recently been completed at Oak Ridge, Mo. It will have a capacity of 100 tons of clay per day.

The Foremost Shipbuilders.

Under the heading of "Our Greatest Shipbuilder," the following is in a New York paper:

"Nobody would have picked him out for what he is—the greatest builder of ships this country has ever seen. He was walking in his soft, stooping way through the corridors of the Waldorf. He is small and dried up, and wrinkled and gray, and serious to look at and utterly insignificant and unimpressive in general. But when you look at him critically you can see sharpness, shrewdness, cleverness sticking out all over. I have seen him sit for days in the Senate gallery, watching as a cat watches a mouse, the progress of bills in which he had a business interest. Few men have had so strong a "pull" with the Government, and with Congress. His influence is felt, but seldom seen. He is far too shrewd to make mistakes. But he also builds good ships. He builds bigger and better ships than anybody else in the United States could build, and the Government finds him and his shipyard a necessity. He is worth millions. The name of William Cramp will long live in history."

The Salt Lake *Tribune* comments as follows:

"Not so fast, please. Maybe the Pacific coast has something to say about that. The Union Iron Works, at the head of which is Mr. Irving Scott of San Francisco, has the best equipment for building ships in America. That company has built as large ships as any other company in America, and in some respects the performances of those ships are more satisfactory than any built on the Atlantic. For instance, the Cramps built a ship which was a sister cruiser to the "San Francisco." It made a little trip down the coast and back, and had so much water in the hold that it had to go to the dock to be repaired. The Union Iron Works built the "San Francisco." It sailed down through the Straits of Magellan and up to New York, and the hold of the ship was perfectly dry. On reaching New York the commander of the ship was asked by the Secretary of War how long before his ship would be ready to proceed to sea, and he answered: "She will be ready as soon as the water can be heated in the boilers." The Union Iron Works has not yet had the chance to build a great passenger steamer like the "St. Louis," but they are all ready to take a contract of that kind, and are perfectly confident of their success if a contract is ever given them, because some of the finest small passenger ships afloat have been turned out from that yard. The Cramps are good shipbuilders, but in our honest judgment the men in charge of the Union Iron Works of San Francisco are as much superior to the Cramps as the Pacific is superior to the Atlantic.

Elements of Motion.

There is no force in matter. All force is the tendency of every particle of matter to establish and maintain itself in the most agreeable relations to every other particle of matter. An ancient and not improbable conception of matter is that, in its rudimentary state, it consists of but two constituents, or of one radical in two states, corresponding to positive and negative. All substance is referred to one or two rudiments. Elements are such compounds as are at present irreducible. They are composed of the rudiments in various forms of combinations and recombinations. Atoms are the theoretically indivisible particles of the rudiments. Elementary atoms are the practically indivisible and inseparable particles of the elements. Molecules are the smallest parts into which any substance may be divided and yet retain its individual properties. There is no matter without properties; properties are things; there are things which are not matter; attraction is a thing which is not matter, but a property of matter. There is no thing, not even an imaginary line, that is disassociated from matter. Gravity is the inclination of every particle of matter to approach every other part of matter. Cohesion is the tendency of particles to cling to particles of the same substance with which they are in immediate contact. Expansion is the occupation, by particles, of more than their original space. Contraction is the occupation of less space. All forces are antagonistic; the triumph of one is the subjugation of the other. Motion results from the conflict of forces; when one overpowers another, movement ensues. All mechanical movements may be traced to these general principles.

WHEN the gulf stream passes out of the Gulf of Mexico, its temperature is about 70° Fahr.

Pithecanthropus Erectus.

Written for the MINING AND SCIENTIFIC PRESS by W. E. ROTZELL, M. D., Narberth, Pennsylvania.

Anything new relating to man, his origin, history, or characteristics, is always received with pleasure; and it is now that anthropologists are intensely interested in the discovery of the remains of a new form that from present evidence seems to meet the requirements of a "missing link" between man and the lower animals more closely than any remains hitherto found.

The earliest remains of man, as is well known, have been found in Europe only, they being those of Neanderthal, Spy, Naulette, Shipka, etc., but now remains more primitive than any of these are reported from the island of Java. This discovery adds greatly to our knowledge of early man, especially to his geographical range.

Dr. Eugene Dubois, in a memoir issued from Batavia, Java, describes these remains as being found near a river at a depth of from twelve to fifteen meters below the surface, in a sedimentary bed of material of volcanic origin, of Plistocene age. It is impossible to estimate the exact age of this stratum, since the question involves many geological points that are not as yet decided.

The remains consist of a calvarium, including a portion of the occiput, and the supra-orbital ridges; a third upper molar; and a femur. The skull and tooth were found associated, while the femur was found fifty feet distant, and possibly may be in doubt. The skull is somewhat similar to those of Neanderthal and Spy, but the walls are not as thick as those of the former, resembling more closely those of the latter.

The cranial capacity of the Java skull is just midway between that of the gorilla and the lowest normal of man. The cranial capacity of the gorilla is 500 c. c. m. In the Java skull the capacity is 1000 c. c. m., and in man the cranial capacity is 1500 c. c. m. The tooth was found close to the skull, and is the last upper molar; it has widely divergent roots, the crowu is large, with the cusps not clearly differentiated, as in the anthropoids and the inferior races of man. The femur resembles that of the man of to-day and indicates that the creature walked in an upright position, just as man, and this fact certainly indicates that it cannot be considered as belonging to any species of ape.

Dr. Dubois not only considers this form to be a new species, but also a new genus and a new family, placing it between the *Simiadæ* and the *Hominidæ*. The name given to this being by Dubois is *Pithecanthropus erectus*, which means "a monkey man standing upright."

If. after this matter has been carefully weighed by science, it is decided that man's advent into the world occurred in the region of Java, previous theories regarding his place of origin will be shown to have been incorrect. Scientists have looked for the origin of the race in southern Europe and in Africa, where man's nearest relations among the lower animals still exist.

The Mineral Lands of the State.

TO THE EDITOR:—An attempt is being made to take the settlement of the mineral land to the courts.

That would certainly be very acceptable to the railroad company; it would then be settled like most of the large estates are in California. The heirs get the decision, but nothing else. In this case the miners would get the decision and the R. R. Co. the land. It would all be sold in large tracts years before the courts would settle it.

The courts are a city of refuge for this corporation. What has been said about settling this mineral and agricultural land dispute originates with the R. R. Co.

The Supreme Court of the United States has already decided that mineral land was not included in the railroad grant. But the Land Department persistently refuses to provide any way for the miners to prove what is mineral land. If the Secretary of the Interior understands what kind of land is being patented to the R. R. Co., it is certainly a surprising state of affairs. It leaves no land that can be called mineral. There can be question honestly raised in regard to nine-tenths of this disputed land now being patented in northern California. All the information to be obtained from the Land Department at Washington would lead us to believe that they regard the mountains of northern California as being as level as the plains of Kansas. They were certainly educated in a school where geography was omitted from the course of study. Many of the sections are so remote in the mountains that it would require $5000 to build a passable road to them, and, when built, not one acre of land suitable for farming could be found. And it is a well-known mineral region. Some might say, "Why not file a mineral affidavit and contest?" It is expensive to contest a section. You must be well acquainted with each of the smallest legal subdivisions. The existence of mineral on each must be proven, and mineral in paying quantities. You must meet a lot of fixed questions, which it is impossible to answer, that are kept as stock in trade by the R. R. lawyers.

Must the miner conclude that about all mineral land is going to be patented to the railroad company without considering right or law? Such a conclusion would not be inconsistent with the facts. The miners are loyal citizens of this republic. They pay taxes and obey the law, and why our officers in authority allow them to be plundered by this railroad corporation, I suppose, cannot be found out. Such things are not permitted under any monarchial government on earth.

The railroad officials are writiug letters and having them published where they think they will do the most good, in which they deny their right to the very kind of land they are patenting under the rulings of the U. S. Land Department. The miner must stand idly by and see the double dealings going on which rob him of his rights. Of all the corporation steals of the peoples' property, none have been more iugeniously and cunningly planned than this mineral land steal. It has taken years to consummate it, and make the miner believe he has a chance to save what belongs to him, when no such chance exists

The railroad officials display excellent judgment in selecting the best mineral land there is up this way. The selections are made in the most rugged and broken mountains where mineral is most likely to be found.

Justice is certaiuly dead!

Shasta, July 12th, 1895. JOSEPH E. BELL.

Exporting American Ore.

On a few occasions in recent years the United States carried coal to Newcastle, and now it has started to export iron ore to the great ore-producing countries of Europe. According to the *Iron Age*, of New York, some shipments of ore have been made to the European markets, which that paper says are the first in the history of the American iron trade. This does not mean that iron ore in general can be produced here as cheaply as it can on the other side of the Atlantic, and that this country can hereafter meet the competition of the outside world without asking any favors at the custom house. The higher cost of labor in this country more thau offsets such advantages as are on the side of the American iron producer.

The ore which is at present being shipped is to meet a demand in Germany, England and other countries in Europe, but particularly in Germany, for ores which are high in phosphorus. At present Germany is paying an extra price for ores of this class. Some of the German demand, which has been growing rapidly in recent years, has been met in England and Sweden, but the American ore which is now being shipped is more suitable for the purpose and commands a higher premium. This ore was mined near Lake Champlain, in which locality, it is said, the deposits are richer in phosphorus than those of any other part of the United States. It is shipped on canal boats from Port Henry, N. Y., to New York and transferred to the European steamers.

Shipments of ore to England, it is expected, will soon reach the proportions of those to Germany. The ore which is to go to England is a special variety for basic open-hearth purposes. It is probable that a large market for these special grades will be found in Europe. At present the exportation is aided by the general lack of freight to Europe and the consequent lowering of rates, which gives the American shipper an advantage that he will lose a few months hence when the regular traffic increases. It appears to be the intention, however, to provide boats especially built for this sort of freight, and in that event the low rates will remain. The point of particular interest is that the United States is constantly reaching out for new markets for its products and finding new avenues for the employment of its activities.

Coast Industrial Notes.

—The first shovelful of earth was turned last Tbursday at Stockton on the construction of the Valley road.

—The steamer Bawnmore goes to Portland, Or., from Paytu, Peru, via this city, with crude oil for the Portland Gas Company.

—Mariposa county has voted favorahly upon the proposition to issue $15,000 honds to huild a road between Coulterville and Mariposa.

—Oakland men have patented a process for refining California oils, which is claimed to furnish clear, clean oil which burns without smoke or odor.

—D. O. Mills is credited with intention to extend the Carson & Colorado to Mohave within two years and make the road a standard guage throughout.

—Stockton men are about to engage in the manufacture there of tartaric acid and cream of tartar from the sediment and dregs of wine casks, which is in abundance here.

—The lateral canal north of Amsterdam, Merced Co., is completed. It taps the main canal eight miles northwest of Yosemite lake, is seven miles in length, five feet deep and fourteen feet wide on the bottom.

—Blue Canyon, Wash., coal will be used hy the Great Northern Railroad Company on the Cascade division. This, in conjunction with the contract awarded by the United States Government for 3000 tons a month, will necessitate an increase of operatives from 80 to 100 men.

—British Columbia will soon he shipping her salmon all the way to England in paper. Cans made of paper pulp are being introduced to take the place of tin cans for containing all kinds of preserved produce. The salmon pack this year will he a large one, possibily about 450,000 cases.

—The Cumherland coal trust in this city which advanced the price of Cumherland coal from $13 to $13.50 a ton received a serious check last week by the arrival of the Washtenaw which had 2000 tons ahoard consigned to P. B. Cornwall. After its arrival San Francisco hlacksmiths were ahle to get Cumherland coal for $8 a ton.

—The Fair Oaks and Orangevale Railroad Company has incorporated in Sacramento to huild an electric railway between that city and Orangevale, a distance of twenty miles. Power will be secured from the canal at Folsom. The road will he for hoth freight and passenger traffic. Capital stock, $500,000. Directors, L. T. Hatfield, T. B. Hall, G. M. Mott, William Schaw and F. E. Cox, of Sacramento.

—There is a general movement among the merchants, manufacturers and producers of this city to secure a more extended market for home manufactures, yet, with singular obtuseness, the "Lahor Unions" of this city frown on the effort and the "Lahor Council" decides to take no part in tbe movement. Of all peoples they are most interested, for its success means their gain greater than any other class.

—Several prominent men have organized a company to manufacture and introduce a mixture of peat and asphaltum for fuel. A large tract of peat land has been hought in the San Joaquin valley; asphaltum deposits have been secured in Ventura county, and the company proposes as a starter to build in this city a small 100-tons-a-day plant, and introduce the new fuel, which, they say, can he furnished the consumer for $2.50 per ton.

—Nearly every interior paper in the State, commenting on the success of the great Folsom-Sacramento electric power transmission scheme, points out that water power in the vicinity of the place where the paper is published exists in sufficient quantity to warrant the erection of similar plants should capital decide that the enterprise would he a paying one. This is one of the cases where the supply first creates tbe demand, and then regulates it.

—Rate cutting is on again north and south of San Francisco The opposition steamers hetween Columbia river and Puget Sound ports bave again forced the larger corporations to make special rates to Portland, Astoria, Seattle and Tacoma. One dollar per ton is charged for freight to these points, and passenger rates have again dropped to $10 to Puget Sound points, first-class, and $8 to Portland and Astoria. The steamer Washtenaw is advertised to sail for Panama direct, in opposition to Pacific Mail.

—Since the English company paid $300,000 for the Iron Mountain property in Shasta county, it has been a question as to the building of a railroad and smelter, which has heen decided in the affirmative. It is announced that a smelter with a capacity of 1000 tons per day will be huilt five miles from Redding, and that a survey has heen agreed upon for a road from the mine. This means a good deal to that section of the State, and if the plan outlined is pushed to successful completion, it will he a matter of mutual profit to all.

—A complete electric plant has been established hy Wm. Sutton, in Euculet district, Barclay sound. The greatest difficulty which the lumhermen there have to contend with is transporting the trees, after they have been felled, to the water. Once afloat, it is easy to handle them. Dependence has had to he placed hitherto on teams of mules or horses, or on steam power, when the services of a portable engine could he hrought into use, and in the Barclay sound region it has heen a source of great trouhle and expense to transport and operate even the portable engines.

—There are ten oil-hurning engines in service on the Southern California railway, Santa Fe system, equipped with the Booth hurner and combination oil and water tank. The oil tank is enclosed in the water tank and is surrounded by water. The reservoir holds 1750 gallons of oil and the water reservoir holds 3900 gallons or ahout fifteen tons of water. The oil tanks are provided with safety valves which close automatically. The engine used in passenger service has 18x24-inch cylinders, with wheels 62 inches over all, and makes the round trip of 265 miles without taking oil.

—Fuel petroleum is now delivered here for $1.50 per barrel of forty-two gallons, which is an equivalent to coal at $4.50 per ton. There are nearly 300,000 harrels of crude petroleum stored in Ventura and Los Angeles counties. The Union Oil Company of Ventura county has twenty miles of main pipe line with over eighty miles of feeders, leading to the sea at Ventura, and the Pacific Coast Oil Company is huilding forty miles from the Newhall or Pico district to Ventura. The latter company has in the course of construction at the Union Iron Works an oil steamer of 6000 harrels capacity to transport their own production to their refinery at Alameda.

—Mr. Meade, the active secretary of the Manufacturers' Association, has inquiry regarding the feasibility of a bicycle factory here. The hicycle makers cannot keep up with the demand, which is not like some new "fad" or "craze" for some new thing, which hurns like straw in fierce but fading flame. It gives promise of permanency. The State is sending hundreds of thousands of dollars away for wheels, and in the line of assistance to home industries it is believed that a good California-made bicycle would sell well, and a bicycle factory be a paying institution. In response to a letter from Mr. Meade, offers of sites, etc., have heen received.

—The concession granted several years ago to the Maritime Canal Company hy tbe Nicaraguan Government for the construction of the Nicaraguan canal is for the second time in great danger of heing cancelled, and if annulled this second time will be otherwise disposed of. The Nicaraguan Canal Company will he notified soon that the Nicaraguan Government will hold them to their original proposition and the canal at Tipitapa must be constructed and completed within a short period. In this they are firm, and should the canal company either refuse or neglect to carry out the original plan, the concession will be annulled finally. It is generally understood in Managua that if the work is not hegun very shortly, or if the canal company does not take almost immediate steps to convince the administration that the Tipitapa canal will he constructed, the next meeting of Congress of Nicaragua will ratify the cancellation of the concession, which Minister Gomez would not hesitate to hring ahout.

Europe's Gold and Silver Yield in '94.

	Gold.	Silver.
Russia	$27,646,000	$ 420,500
Germany	2,203,100	8,027,300
Austria-Hungary	1,684,000	2,548,400
Sweden	62,500	119,200
Italy	117,000	1,200,500
Turkey	8,000	63,000
France	185,300	4,076,10[illegible]
Great Britain	65,800	329,7[illegible]
Spain	.....	2,643.[illegible]
Norway	.....	195.
Greece	.....	1,472
Totals	$32,970,700	$21,096,300

Scientific Progress.

Self-Induction in an Electric Wire.

A phenomenon which embarrasses the practical electrician in many ways, but especially in telegraphy and telephony, is called self-induction. Each time the flow of a current is stopped or started a certain lag, is produced as if by inertia. This is exceedingly short in point of time; and its extent depends somewhat on the size and length of the conductor and some other circumstances. So long as the current continues to flow in one direction there is no difficulty of this kind; but it is as if a certain momentum had to be acquired or overcome each time the circuit is closed or opened. Hence, in sending messages over an ocean cable, the speed with which the letters are formed by interrupting and restoring the current, no matter by what code of signals, is limited by this tendency to blur, in consequence of self-induction. The same trouble is encountered in long-distance telephony, and is an absolute barrier to this form of communication under the Atlantic ocean. Now that alternating currents for light and power are coming into such extensive use, the phenomenon manifests itself in another way. A certain amount of voltage is wasted in overcoming the induction of the line. In the first two uses of electricity here mentioned the effect which is chiefly lamented is impairment of efficiency; in the latter two it is the economical phase of the subject which attracts the most attention. Both considerations have incited efforts to obviate, or at least to lessen, this evil.

Self-induction itself seems to result from the resistance offered, by the dry air or insulating coat surrounding a wire, to the progress of the iuvisible rings of force which encircle a conductor and move forward when an electric current flows. That resistance once overcome, all goes well until the current ceases, when a corresponding change occurs in the surrounding non-conductor or "dialectric." Now, if a frequently interrupted and restored current be led back through a second wire parallel with the first, but insulated therefrom, a fresh set of effects, occurring simultaneously and showing about the same intensity, but always in the reverse direction from those produced by the other wire, will be developed in the dialectric; and if the two conductors are placed pretty close together the one set of impulses will be partially offset by the other. Experience having shown that self-induction could be lessened in this manner, some one conceived the idea of making the supply and return wires eccentric; that is, one formed as a shell outside the other, but separated from it by a layer of insulating material. This is a more costly arrangement than laying two wires parallel to one another, no doubt, but it is expected to prove more efficient. Tests recently made by Professor Guye, with the concentric conductors employed in connection with an electric lighting plant in Geneva, Switzerland, tend to confirm this belief. Using the core for a "lead" and the shell for a return, he found that the voltage of a high-tension alternating current would not show any greater drop in a given distance than a continuous current would.

Dynamo and Steam Engine Efficiency.

Prof. Unwin complained, in a recent lecture, that electrical engineers were in the habit of comparing the efficiency of the dynamo with that of the steam engine, greatly to the discredit of the latter. It is a common saying, he adds, that the efficiency of a dynamo is from 90 to 95 per cent, while that of the steam engine is only about 10 per cent; but this comparisou is an unfair one, and shows a lack of comprehension of one of the two fundamental laws of thermodynamics, namely, the law of the motivity of heat. Heat energy is undirected energy, and only a fraction of it is convertible into mechanical energy. Working, as it must, with only this available fraction, the steam engine is not an inefficient machiue. The task of the dynamo is simpler. Electricity is directed energy in a wholly convertible form, and it is therefore only necessary to transform one kind of directed energy into another. In order to do this, only a small fraction need be wasted.

"Running Slow" of the Earth.

Lord Kelvin estimates that the "running slow" of the earth in its daily rotation round its axis amounts to twenty-two seconds per century. The main cause of this retardation is the friction caused by the tides, which act as a brake, the action of which has been calculated by this eminent physicist to be equal to a weight of 4,000,000 tons applied on the equator. Other causes have also to be taken into account, as, for example, the increase in the size of the earth, due to the falling on it of meteoric dust, which, if deposited at the rate of one foot in 4,000 years, would produce the observed retardation by itself. Such a phenomenon as the annual growth and melting of snow and ice at the poles is capable of introducing irregularities into the problem, the growth at the poles, by abstracting the water from the other part of the ocean, accelerating the earth's motion, and the melting, by restoring the water, retarding it. Against the retarding forces there has to be taken into account a probable acceleration, due to the general shrinking of the earth by cooling; but this Lord Kelvin believes to be very small—perhaps not more than 1-6000th part of the retardation due to the tidal friction. Professor Newcomb has declared, from astronomical considerations, that the earth went slow and lost seven seconds between 1850 and 1862, and then went fast and gained eight seconds between 1862 and 1872, changes of rate explicable by possible changes in the earth's shape, so slight as to be quite undiscoverable in astronomical observations.

THE *Times-Herald* of Chicago has first used the telautograph in furnishing press dispatches. That paper recently published photographic fac-similes of a number of messages iu the identical handwriting of the author, sent to it the previous night from prominent men who were in attendance at the League Convention at Cleveland. The test was successful. The instrument worked perfectly over a circuit 430 miles long. The ordinary telegraph circuit is only about 500 or 600 miles, automatic repeaters being used where the distance is greater. No repeaters were used in the *Times-Herald* test between Cleveland and Chicago, and the work of the instrument was a surprise, even to those connected with it. The longest trial heretofore given the telautograph was between Paris and London, the test being a private one. When Prof. Gray first conceived the idea of the telautograph, it is said, he had no idea of ever using it for long-distance work.

THE intensity of starlight can now be measured so accurately with electrical devices that this system is fairly comparable with the other methods. Indeed, with stars of the first and second magnitudes, it is not necessary to use even a telescope. The apparatus employed consists of a clean bit of aluminum, coated with selenium, and dipped into venanthol. A galvanic cell is thus created, aud the fluctuation in the current produced, or rather the square of the potential developed, is proportional to the light.

A FRENCH PHOTOGRAPHER has arranged an alcohol lamp so that, while it is immersed, he can throw powdered magnesium into the flame and thus secure a very brilliant light under water. In this manner he has been able to obtain some clear and beautiful photographs of the bed of the Mediterranean. Oxygen is carried down in the apparatus to promote combustion.

Mechanical Progress.

Long-Distance Power.

There are two remarkably long-distance transmissions of power in successful operation in the United States, although neither are electric transmissions and each differs materially from the other. One is the transmission of oil by pipe line from the natural fields of New York, Ohio and Pennsylvania to tide water, a distance of over 400 miles. The other is the transmission of natural gas, also by pipe line, from the Indiana fields to the city of Chicago, a distance of about 120 miles.

The piping of oil, first from the individual oil wells to storage centers, and then from these storage centers to tide water, has been a process of gradual development for the last thirty years. The individual wells were gradually connected by feed pipes to larger trunk lines, which carry the oil to the storage centers.

There are twelve pumping stations along this line, situated about thirty-five miles apart. The pumps operate at a pressure of about 1000 pounds per square inch, and the capacity of the line is about 30,000 barrels a day.

The main pipe line is divided into divisions and sections, much like a trunk railway system, and has, similarly, its division superintendents and engineers, section foremen, line gangs and line walkers, telegraph stations and daily reports.

The natural gas pipe line is, perhaps, a more simple example of long-distance power transmissions, and bears many striking points of resemblance to transmission by electricity. In the Indiana gas field about sixty wells are in operation, having an average daily capacity of about 5,000,000 cubic feet each. As in the oil fields, so here, the individual wells are connected by feed pipes to a supply line, which collects the gas and carries it to a pumping station. There large compressors, capable of producing and sustaining a pressure of 200 pounds per square inch, force the gas into the transmission line to Chicago. The normal pressure carried on this line is 300 pounds per square inch, which admits of a daily delivery of from 10,000,000 to 12,000,000 cubic feet of gas in Chicago, where it is sold at a price much below that of ordinary illuminating gas.—Cassier's Magazine.

Vehicle Motor Race.

A prize of $5,000 is offered by the Chicago *Times-Herald* for the successful competitors in a horseless carriage or vehicle motor race between Milwaukee and Chicago. The date of the contest will be about the 1st of next November.

First prize, $2,000 and a gold medal, the same being open to competition to the world.

Second prize, $1,500, with the stipulation that in the event the first prize is awarded to a vehicle of foreign invention or manufacture this prize shall go to the most successful American competitor.

Third prize, $1,000.

Fourth prize, $500.

The third and fourth prizes are open to all competitors, foreign and American.

Machinery and Men.

Mechanical establishments that are up to date are the only ones that will be able to stay in the field. Competition has been forced to so fine a point that the manufacturer, who would do any work at all, must figure every element of production cost down to the lowest possible notch. This he can do only with all the instrumentalities used by those with whom he competes. His competitors use the latest labor-saving, power-saving, time-saving and quality-raising machines, methods and processes, and if he attempts to get along without just as full an equipment, and of just as high a grade, he at the start places himself in a position or a condition that makes his defeat inevitable.

When is an establishment up to date? When there is in it no necessity for doing work twice, no necessity for using power to move a piece of metal in any other than a direct way from start to finish, no machine that is inferior to any other machine of its class, no part of equipment that causes constant wastage, however small, of fuel or steam, and no lack of the best machines to do easily and without abusive forcing all work that comes. Along with this up-to-dateness in equipment must go an equal to-dateness in the force of men employed. The finest machines are the cheapest in the end, providing they are used by the best of workmen. The shop in which first-class machinery is matched with first-class men is the only shop that can and will turn out satisfactory work.—Gazette.

Trials of a 320-Horse Power Gas Engine Using Power Gas.

The gas engine was of the Simplex type made by Matter & Co., of Rouen, and was used to drive the Pantiu mills.

The gas in this installation was made in producers of the Buire-Lencauchez system. The author states that with gas made in these producers this engine has given 320 I. H. P., whereas with ordinary lighting gas the I. H. P. would rise to 450.

The cooling arrangements were such as to enable the engiue to run continuously, and the trials in question lasted some 194 hours. During this time, 19 tons 15 cwt. 2 qr. of rough coal were consumed in the gas producers. The engine was, during the trial, driving the milling machinery, and by care a constant load was obtained corresponding to a mean I. H. P. of 280. This gives a consumption of fuel of 0.81 pounds per I. H. P. The quantity of circulatiug water needed was 1340 gallons per hour in the water jackets, and 660 gallons in the gas washers; in all 7.15 gallons per I. H. P. hour.

The trial was repeated after an interval of three months, and the figures obtained were practically the same.

The author concludes: first, that the quantity of gas produced per pound of coal varies from 64 cubic feet to a maximum of 80 cubic feet; second, that the calorific power of the gas varies between 34 and 42 calories per cubic foot, whatever coal be used; third, that the best and most economical explosive mixture corresponds to the consumption of from 50 to 70 cubic feet of this gas per I. H. P.—L'Industrie Electrique.

The Seasoning of Stone.

Stone, like lumber, requires seasoning. Stone is often spoken of as the synonym of solidity—"as solid as a rock," we say—but, as a matter of fact, stone is very far from being solid. A cubic foot of the most compact granite, for instance, weighs about 164 pounds, while a cubic foot of iron weighs 464 pounds. This plainly shows that in between the atoms which compose the mass of the most enduring stone there exists much space for air, moisture, etc. This seasoning of stone prior to use for building purposes has been well understood by the architects of all ages, but in the modern rush of nineteenth century building too little attention has been paid to it. Now it enters into the calculations of every good architect.—Scientific American.

ACIDS in lubricating oils may be detected by putting the samples to be tested in a clear glass bottle with a copper wire running down through the cork, air tight. Stand the bottle in a sunny place and leave for two or three weeks. If on removal verdigris or green rust is on the copper, there is an acid in the oil.

AN Austrian engineer, Herr Pfister, declares that the salt may be removed from ocean water by forcing it through wood in the direction of the fibers, under a pressure of twenty-three to thirty-eight pounds to the inch.

Electrical Progress.

The Folsom Power Transmission Plant.

Long distance transmission of electric power got great advancement during the week. The Folsom Water Power Co. has demonstrated the success of the scheme to generate electrical power at Folsom, in this State, and transmit it to Sacramento, the State capital, twenty miles distant. Last Saturday morning the power was turned on successfully. The breaking of the quadrant on the governor of the turbine wheel at Folsom delayed the movement of the machinery at Sacramento, but that is only a matter of detail and can readily be remedied. The fact of the successful transmission of electrical power over the longest line in the world was the main point. It is expected hy those in charge that hy the 1st of August the entire capacity of the 4000 H. P. can he utilized. For thirty years the scheme of utilizing the fall of the American river near Folsom had been in the minds of many, hut since the general application of electricity the original idea was augmented. In May, 1888, the directors of the State prison, on hehalf of the State, made an agreement with the company, the State to furnish the labor uecessary to huild the canal, dam, power house and electric work for the prison, and to receive in return the use of the first five feet fall of the water, the equivalent of several hundred horse power. The power house and electrical plant at the prison is State property. The plant with seventy feet fall of water at Folsom, two miles helow the prison, belongs to the company.

The dam is built of granite laid in Portland cement; is 650 feet long, 89 feet high iu the center, 87 feet wide at the hase, 25 feet wide on top, and is provided with a wooden shutter or flashhoard six feet high, which at high water is lowered into a recess in the crest of the dam. At low water this shutter is raised by hydraulic pistons, the depth of the hasin is increased by six feet and additional storage capacity for the waste water provided. Normally the dam forms a storage basin or reservoir three and one-half miles long and has a capacity of 13,000,000 cubic yards of water. At each side are head gates operated by hydraulic machinery, each 16 feet wide.

The west side canal is 40 feet wide at the top, 30 feet wide at the bottom and six feet deep.

The east side canal is 50 feet wide at the top, 40 feet wide at the bottom and eight feet deep, having a capacity of ahout 87,000 cubic feet of water per minute. The canal, divided into three sections, follows the hank of the river for about two miles, and is constructed partly of masonry, partly in deep solid rock cuts and partly by earth cuts and fills.

The power house is on the west side of Folsom. Here the canal widens into a forhay, 150 feet long, 100 wide and 12 feet deep. It is divided into two parts by a wall provided with suitable gates, so that one side may be cleaned out while the other is in operation. At the lower end of each section of the bay a sluicing gate connects with the lower river by a sluicing canal, and through these the sand and dehris is carried away and kept from the wheels, of which there are four pairs, each pair having a capacity of 1260 H. P. at 300 revolutions per minute, operated under a head of 55 feet. The water, after having passed the turbines, will be discharged through tunnels under the power house into irrigation canals.

Each of the four generators has a capacity of 1000 H. P. They are the largest three-phase generators in use. The wheels and generators are on the first floor of the building, sixteen feet above the level of the water in the tail race. The water wheel regulators are in the dynamo room, the operator having full control of the hydraulic machinery in sight of the electrical instruments on the switchhoard.

The hydraulic part of this plant was furnished hy the Morgan Smith Iron Works, of York, Pa., under contract with the Pelton Water Wheel Compauy of this city, and consists of four pair of 30-inch McCormick turhines of 1260 H. P. capacity each. The wheels run under a head of 55 feet at 300 revolutions and are direct connected to the armature shafts of the generators by insulated couplings. The inlet pipes are 8 feet diameter and made of ⅝-inch steel with double draft tuhes.

Each pair of wheels is furnished with a steel fly-wheel ten feet in diameter, weighing 10,000 pounds, having a peripheral speed of 9425 feet per minute. To provide for the centrifugal strain that such a high velocity gives, heavy tires are shrunk on to the rims. The exciters are run by two special wheels of a size to give them the proper speed, which are also direct connected as in the case of the larger wheels. The governors are of the Feasch-Picard type, the same as are used on the Niagara wheels, and heing located in the generator room are convenient for ohservation and control.

The wheel buckets are made of phosphor hronze, and the work throughout embraces the latest and most improved practice iu hydraulics. The wheels and accessories weigh upward of 400,000 pounds, and the plant, as a whole, is the most massive and powerful in the world, with the single exception of that at Niagara.

The sub-station step-up transformers are in the second story of the power house. In them the voltage, generated at 800 volts, will be raised to 11,000.

The pole line is double from the Folsom power house to the Sacramento transformer sub-station. Each circuit consists of three bare copper wires supported on double petticoated porcelain insulators. Iu the transformer room the transformer switch-boards receive the terminals of the 10,000-volt transmission lines and operate the different combinations of the transformers.

In the main room are three 300-horse power three-phase synchronous motors directly connected to a line shaft, which is provided with clutch pulleys and will drive several 500-volt continuous current railway generators and a numher of arc dynamos.

Of the power created, it is figured that ten per cent is lost in transmission to Sacramento, auother ten per cent at the Capitol City, making 80 per cent available. The Folsom plant generates electrical impulse available for light, heat or power. The success of this enterprise will result in numerous other projects of a similar character in various parts of the State being now pushed to practical completion.

Effective Electric Lighting.

In the early days of electric lighting people were apt to think a great deal more of the mere fact of using an electric lamp than of the actual efficiency of the light given by it. Nowadays, however, the consumer is probahly perfectly able to tell whether he is getting full value in light for the money he is paying the central station; and between the strict exaction of the consumer aud the competition of rival lighting systems, the electric light company can only hope to succeed by the hest service. Much attention has been drawn of late to obtaining the most desirable results from different methods of lighting, and the suhject has been hrought down to two main considerations—reflection and diffusion. In factories and large shops it is likely that the old practice of allowing the light of the arc lamp to fall downward will be discarded. It is found that hy inverting the lamp and throwing the light to the roof—preferahly of white—by a powerful reflector, the rays are so diffused throughout the building as to give the maximum efficiency without straining the eyes of the workmen. The prevailing methods in outdoor lighting, too, are condemned as crude and unscientific. The present street arc lamps dazzle the eye, throw sharp shadows and waste light. The next improvement in street lighting will probahly he to use lower candle-power lamps, placing them proportionally nearer together, at, say, the height of an ordinary gas lamp, using suitahle reflecting hoods, and making the bottom half of the globe semi-opaque, and possibly tinting it a deep orange color, ohviating the present glare. For incandescent lamps a luminous enamel is now used which entirely hides the filament, and at the same time disperses the light thoroughly. The enamel is made in various colors, but the white is to be preferred for general purposes. In domestic lighting, dioptric shades, having prismatic corrugations on their surfaces, are coming into vogue. They give a good diffusion of light with little absorption, and when made of either plain or tinted glass have a brilliant effect. In decorative lighting many new ideas have sprung up in the distribution of masses of light in interiors, but none have yet superseded in beauty and effectiveuess the system introduced last year of putting the lamps out of sight and lighting the room entirely hy diffused and possihly colored light. This will probably be the method of illuminating churches in the future. In churches where it has already been adopted the effect is described as so infinitely restful and appropriate that, in comparison, the ordinary methods of church lighting seem garish and barharous.

Fresno's Electric Transmission Project.

The Folsom-Sacramento electric transmission success starts similar schemes in several sections of the State. A Fresno corporation has contracted for three 450-H. P. tri-phase dynamos with alternating currents to be ready for use December 1, 1895, to supply light and power to that city. Like the Niagara and Folsom propositions, water will furnish the original motive power. It will be taken from a point six miles above the mouth of the north fork of the San Joaquin river, whence a canal will lead it along the summit of a ridge to a point 1410 feet above the river bed, where a reservoir covering eight acres has been huilt. The water will he piped from this reservoir to the foot of the mountain, ahout seven miles. From the power house to Fresno is about thirty-two miles. The engineers in charge calculate that 900 H. P. can be delivered at Fresno at ahout one-half the present cost of power there.

In English dynamos, according to *Engineering*, it is usual to wind the coils outside of the soft iron core, but in America the practice of inserting the copper in slots in the core is preferred. The latter method has the advantage of allowing the core to run almost in contact with the field magnets. The consequent reduction of the "air space" allows the maker to use smaller magnets. A machine of a given power, therefore, can be built by this method more quickly and more cheaply, and it is stronger than one of the other kind. But English electricians say that the slotted armature dynamos show a tendency to spark at the commutators.

The broad, shallow entrance to New York bay has ouly one channel of sufficient depth to admit deep-draught steamships, and this has long been marked with spar-buoys on each side. They were visihle, however, only by day. To make the channel navigable for large vessels at night, therefore, incandescent electric lights, each of 100 candle power, have been mounted on some new spar-huoys. A cahle six and a half miles long supplies them with current from a dynamo on shore.

Two or three projects for converting water power into electricity, and transmitting the latter to Atlanta over a line seven and a half miles long, are now under consideration in that city. One of them would develop 14,000 horse power, another 20,000 and a third 36,000. These are all modifications of the same general plan.

Practical Information.

A Bicycle Factory.

Only those who have visited a bicycle factory and have observed the great amount of work, as well as the army of men, hoys and girls required in the making of a single wheel, can account for a hicycle costing as much as $100, four times the amount for which a horse may he purchased. Two years ago the price of a wheel was $150, but competition has brought the price down, at the same time that it has made the expense of putting the wheel on the market much more than before.

Chicago is the center of the bicycle industry, where there are forty places where hicycles are made. Twenty of these places are factories devoted exclusively to the manufacture of wheels. So great is the demand now for bicycles that these numerous factories cannot turn them out fast enough to supply those that want them. This is because so many more women are now riding bicycles. One-twentieth of the wheels sold last year were to women, while this year it is one-third.

Special machinery and skilled labor are employed in making the bicycle. Except in the cheapest grade wheels, the best material is used, as this costs very little more than the poorer kind, lahor heing the greatest expense.

A bicycle cannot be made in a day, nor yet with the eyes closed. It is a complication of various things that enter into the makeup of this modern horse.

As far as can be ascertained by a layman, there are twenty-six different parts to a wheel, and all these details are worked out hy different people, each separate piece requiring different handling and passing through numerous hands before it is finished.

In looking at a bicycle, we see that there are four different parts to it—the wheels, the frame, the running gear and the steering apparatus; but iu analyzing it we find that a multiplicity of things enter into its construction. The wheel is made up of spokes, hubs, rims, tires, spoke nipples, ball valves, cups and cones, and the washers that go with them. The frame consists of the diamond-shape set of tubes that join the wheels together, the head through which runs the steering tube, the rear fork, the seat post and crank hanger. The steering apparatus includes the handles, the steering tube, the fork sides around the front wheel, the fork crown and the balls, cup and cones on which the steering tubes turn. The running gear is composed of the pedals and crank which operate on the sprocket wheels, the chain which connects them and carries the driving power and the hall hearings on which these things revolve. The saddle may be included with the frame.

In making the frames, hollow steel tubing is now employed, instead of the solid steel bars formerly used. This lessens the weight and at the same time is stronger for being hollow. An improved method of making the joints also lightens the weight of the wheel and adds to the strength. The joints are now brazed, one piece into the other, instead of being made with the old heavy castings and reinforcements. In the fork crown, too, of the machine, drop forgings are used instead of the heavy castings.

For the rim of the wheels a sheet of steel four feet broad and twenty feet long is put into a cutter that rips it the required widths, and then cuts it into the lengths needed. From this cutter it goes to a machine that bends it into a circular form, then through another that turns up the edges in a concave shape to hold the ruhber tire. After this the two ends are hrazed together, holes are drilled for the spokes, and the rim is finished, except for the nickeling and polishing. The spoke, spoke nipples, hub and washers are all handled separately.

The running gear of a wheel requires particular treatment, as not a single detail of this gear is put into a wheel

without every assurance that it will do its part of the work perfectly. Each piece is made with the utmost precision, after being handled a dozen times, and is tested for every possible strain. Special machinery is required for most of it, and only expert workmen are employed.

Automatic machinery is mostly used in the manufacture of the smaller parts of the wheel and these machines are operated by girls and boys. The oil cups, nuts and rivets used in a wheel are made by automatic machines that bite off pieces of steel, turn them about a few times on automatic lathes, and then throw them out finished and complete. Sprocket wheels are first cut in circular form from a plate of steel by a heavy drop-hammer, then strung together in lots of a dozen or more in a machine whose teeth eat out spaces in the rims, and make the notches, one row at a time, on which the propelling chain turns. For the saddles, certain sizes of leather are soaked and then put through a number of shaping presses until they are of the proper shape. Most of the work is done by girls. A number of boys are employed in putting the spokes in hub and wheel, and a puzzling job it is, too, which one inexperienced could not do. Another trick is putting tires in the rims. The enameling, nickeling and polishing of the different parts are done in the usual way.

When all the different parts of the bicycle are made, they are sent to a large room, there they are again thoroughly tested and then put together. This is called the assembly room.

The Wheel.

A wheel is a contrivance to utilize some of the principles of motion of a ball or sphere.

A ball or sphere moves upon a level surface easier than any other form of solid matter. This is because its center of gravity is not changed in its progress. If a ball moves upon a level surface its center of gravity describes a line parallel to its surface. If a ball is balanced in every direction when it is at rest, the power required to set it in motion is just enough to unbalance it. Like a pair of scales balanced with a ton weight on each end of the beam, a few ounces added to either end will move them.

A carriage wheel in principle is a slice from the center of a ball. So long as such a wheel moves uprightly upon its rim, it has the facility of a ball to move in two directions only. To keep it in this position an axle is put through its center. This adds friction to it and also shortens the leverage by which it is propelled, from its rim to its center.

A carriage wheel has to do duty generally upon a common road. A wheel sinks some in the loose material upon the surface which it has to surmount in its progress. This is called traction or rolling friction.

The rubbing of two substances together causes friction. It is the resistance to the motion of one substance bearing upon another. It increases with the weight or presence of objects at their frictional contact, but not with the extension of the frictional surfaces.

If four blocks of wood or other material of one kind and of a similar weight be placed one upon the top of the other and dragged upon a board or other smooth surface, and the weight or force noted that is required to pull them, then if the same four blocks are spread side by side and dragged upon the same surface, it will be found that the same weight or force will pull them, showing that if the surface in frictional contact be extended, but the pressure upon them not increased, the resistance called friction is not increased. This law applies to axles.

Friction does not increase with the size of an axle, but a wheel loses power or leverage with such increase, also by increased weight.

The actual friction going on within an axle box is more than eight per cent, because we have not taken into consideration the rubbing of the washers on the axle end and collar and the gather of the axle; but as these are so little in good running wagons, they may be neglected.

Traction, or the resistance to the progress of a wheel upon a macadamized road has been practically proved to be about one-thirtieth of the load. The power required to move 500 pounds would be seventeen pounds upon a good hard road; therefore a horse will be required to pull at the rate of 40 + 17 = 57 pounds to draw 500 pounds on free running wheels.

If an obstacle, say four inches high, be in the way of a "four-foot" wheel, the center of gravity will have to be raised four inches to overcome it. The lever to do this with is just half the height of the wheel, viz., two feet. This lever is of the third order of levers—that of having the power come between the load—which is lifted, not pried, and the fulcrum. Neglecting any momentum the wagon may have, and calling it a dead lift, by the law of virtual velocities, "the power multiplied by the distance it moves vertically or in a right line equals the load or weight multiplied by the distance it moves virtically or in a right line."

Now, by adding the friction of the axles and traction—found to be 57 pounds—to 158, we have 215 pounds, which is the force a horse will require to exert to haul 500 pounds up such a slope of a macadamized road. This 500 pounds means all that bears upon the axle boxes; that is, the total weight of wagon and load minus the weight of the wheels.

That the part of a carriage wheel above the axle moves faster or through more space than the part below it is because this kind of a wheel is a lever of the third order. Such a lever has the power applied between the weight, which is to be pushed, pulled or lifted, and the fulcrum, the same as in raising a ladder. Imagine two spokes in a line to be a ladder, the lower end on the ground, the force on hand being used at the hub, the front on the ground, which is the fulcrum, remains stationary, while the upper end moves through a space which will be double the distance that the middle or hub goes. The rim being endless, each point as it touches the ground becomes a new fulcrum. A carriage wheel is thus called a perpetual lever of the third order.

NINETY-NINE of every hundred human beings, says Dr. Cyrus Edson, are unconscious for several hours before death comes to them. All the majesty of intellect, the tender beauty of thoughts or sympathy, or charity, the very love of those for whom love has filled all waking thoughts, disappear. As a little baby just born into the world is but a little animal, so the sage, the philosopher, the hero, the statesman, becomes but a dying animal at the last. A merciful unconsciousness sets in, as the mysterious force we call life slowly takes leave of its last citadel, the heart, and what is has become what was. This is death.

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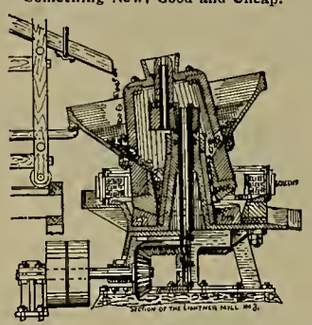
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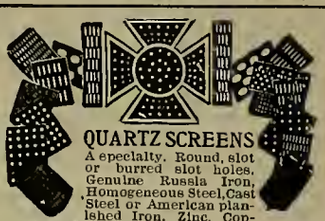
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Mining Summary.

CALIFORNIA.

Amador.

MINING ITEMS.—*Republican*: The Amador Queen No. 1, in Hunt's gulch, is in operation under the management of James E. Dye, agent of the Jackson Gold Fields, an English corporation. There is a 40-stamp mill near the property belonging to the same company. The mine has been prospected to a limited extent. A tunnel has been run 250 feet. At the distance of 150 feet the tunnel connects with a shaft sunk from the surface, and tapping the tunnel at a depth of fifty feet. The intention is to get at the bottom and take out ore for a test run. Assays of samples taken from different points indicate an average of between $3 and $4 per ton. There is a vast body of it, the outcroppings indicating a ledge from 60 to 100 feet wide. It is intimated that the rock can be mined and milled at a cost not to exceed $2 per ton, so that rock milling $3 can be made to pay a fair profit. The company will operate with inexpensive machinery until sufficient development work has been done to prove the character of the property.

ACME.—A. B. McLaughlin has sold this mine to a Colorado company. It is situated three miles east of Volcano. J. D. Gould will be superintendent and Mr. Hearst foreman. Work was commenced last Monday.

At the Argonaut the shaft is down 800 feet. At the Anita they are still drifting east in the hardest kind of rock. It is rumored that unless a change occurs soon drifting operations in this direction at least will be suspended.

At the Alma they are still running west hunting for the ledge. The payment on the Boxall bond is about due, but it is likely that an extension of time will be granted.

THE GOVER.—*Ledger:* The old Gover, which has been idle for months, will start in a day or so. A sixty-stamp mill will he erected at the least. This property is controlled by Utah Church capital and will no doubt be probed to the bottom.

NORTH GOVER.—The north Gover has been bonded for $20,000 and work will be commenced immediately. The Black Hill, close by, has also been bonded.

DOWN MINE.—Al. Harris and J. Gubbins of Kennedy mine are removing to the South Eureka mine, near Sutter Creek, the twenty-stamp mill once owned and operated by the Down mine people.

MECHANICS.—T. D. Valentine has resumed operations at Mechanics mine. One hundred tons of ore will be crushed in the Wildman mill and it is then the intention to put in a pumping plant and clear the shaft of water.

GWIN MINE AND MONTANA MINE.—The shaft in the Gwin mine is down 820 feet; at 900 to 1000 feet they expect to find some stringers of quartz. The crosscut is in 175 feet.

At the Montana mine they have struck the hanging wall and will follow this for some distance. They are now down nearly 65 feet and will put in a pump and engine to hoist with, also build houses, erect a mill of twenty stamps and make other improvements.

Butte.

SHIPPING SULPHURETS.—*Mercury:* The Banner mine is engaged this week in shipping many tons of sulphuret concentrates to the Selby refining works at San Francisco. The product of the concentrators is allowed to accumulate at the mine until many tons are on hand. Then it is sacked and hauled by team to Oroville and shipped in carload lots.

Mariposa.

A TEN-STAMP MILL.—A ten-stamp mill was shipped last week to the mining property of Cox & Roberts of Madera. The property is situated in Mariposa Co.

Nevada.

A BIG CLEAN-UP.—*Transcript:* The last clean-up at the Harmony drift gravel mine was highly satisfactory, being about the largest made there in a long time. Splendid gravel is being taken out right along and the prospects are that the present good returns will continue and that the company's indebtedness will soon be liquidated and the stockholders begin to receive dividends.

GRAVEL CLAIM PURCHASED.—*Transcript:* A company recently organized at Graniteville has purchased the gravel mine at Chapparal Hill, near Graniteville. The mine has been the property of J. T. Cline, and in years past some fine gravel has been extracted from it and the idea is that there is plenty left. The new company will develop the property systematically, and good returns are expected.

MINING DEAL IN PROSPECT.—The mining sale talked of for several weeks is likely to come to a head within thirty days, and then we shall see what old Comstockers can do in the way of opening up the two properties referred to—the Nevada City and the Chapman mines. It is said that when they get hold of these properties more men will be employed than at any two mines in the district, and their new hoisting and pumping plants and mills will equal, if not excel, anything in the district.

Siskiyou.

GENERAL NOTES.—*Journal:* The third cut at the Benz Bar mine, near Honolulu, Klamath river, has been commenced, with prospects of still better yield than from the two former cuts to bedrock. This is considered the best claim on the river, but the Chinese working it never tell how much they take out.

The Lee Hung Co. on Klamath river, just above the mouth of Humbug creek, has one of the richest river claims in the country, but no one can find out what amount is realized. A mining expert offered the company $10,000 for it, but the price asked was $40,000, and no one believes it could be bought for that sum. There is at least eight to ten feet of bedrock gravel, over forty feet wide, that shows gold to the naked eye.

The David ledge near mouth of Shasta river, on the Klamath, still continues to prospect well. It is a blanket ledge, the rich pockets being found where it strikes an upright ledge. The ledge extends along the surface about a quarter of a mile back of the river, and runs in waves, up and down, with sulphurets of iron underneath, next to the base rock. This ledge is supposed to be a continuation of the Burleson ledge at Ash Creek on opposite side of the Klamath.

Sooger & Dame, working the old McConnell & Quinne and Pacific mines on the island in Klamath river, at mouth of Humhug, are working high bedrock, day and night, with a large force employed. They expect to take out considerable money from the gravel near the surface, supposed to be the debris accumulated from the wash of Humbug creek. This firm has expended about $7,000 in putting in machinery to work the claim, and it is now well rigged for successful operation.

Sonoma.

A HEALDSBURG INDUSTRY.—A five-stamp mill was received by the Healdsburg Paint Company last Thursday which will be put in operation and will enable the proprietors to turn out thirty tons of paint a day.

Tuolumne.

WAGON ROAD FINISHED.—*Democrat:* F. Hill, Superintendent of the Wheeler-Hill mine on Moccasin Creek has about completed a wagon road to Moccasin Creek and to the mine.

THE CRYSTALLINE MINE.—C. E. Shaffer, manager of the Crystalline mine, below Jamestown between the Alabama and Trio mines, has fifteen stamps in operation.

NEVADA.

STOREY COUNTY.

THE PROPOSED DRAINAGE PLAN.—*Enterprise:* Colonel Boyle, the superintendent of the Alta, being asked concerning the proposed plans to drain the American Flat country, said: "Perhaps it is as yet a trifle too soon to talk about the American Flat country, but it is already practically decided that drain tunnels are going to be run, not only to American Flat, but to Silver City. The Alta shaft has connection with the Sutro tunnel and a drainage tunnel will be run from this point 6000 feet to the Silver City country and another 6000 feet to the American Flat. The Comstock Tunnel Company has practically made a proposition through its president, Mr. Franklin Leonard, to run the tunnel to Silver City, if the Gold Hill and other mining companies interested would run a similar drainage tunnel to the American Flat country. This plan has been virtually accepted by all parties concerned, and we may expect to see actual work begun within the next month or so. In all, 18 mining companies are interested in the proposed American Flat drainage tunnel. These companies represent from 100,000 to 108,000 shares each. The total cost of running the tunnel will he $200,000, or somewhere from 10 to 12 cents per share."

THE NEW DEPARTURE.—Work has been commenced at two points on the Brunswick lode. On the section of the lode which is to be prospected by the Hale & Norcross Company preparations are being made for sinking an incline. The incline will start in quartz that prospects well in gold. It is expected that a good deposit of paying ore will be found at no great depth below the surface. The Gould & Curry Company will prospect their section of the vein by drifting from the 400 level of shaft No. 3 on the Sutro tunnel. They are of the opinion that by drifting from the shaft they will reach pay sooner than they would were they to run an incline.

The only new development on the Comstock of late worthy of note is a streak of ore assaying $100 a ton recently found in the Potosi. This will give a valuable addition to the ore-producing sections of the mine.

Franklin Leonard, president of the Sutro Tunnel Co., says to the *Enterprise*:

"There is no reasonable doubt in my mind that pay ore in paying quantities will be found on the Brunswick lode, and the Comstock tunnel is well nigh indispensable to the economical development of this great ledge. You remember I spoke to you some time ago about shaft No. 2. It is now in need of repairs, which will be commenced immediately on my return from New York. By means of this shaft and the tunnel the ore of the Brunswick can be transported to Sutro at a very small expense. It is the purpose of the Tunnel Company to build mills at Sutro, as I have before told you. Water power is to be taken to the Brunswick lode to operate the hoisting machinery there. An 8-inch pipe is to be laid from the Virginia and Gold Hill Water Company's head. This is now a settled fact. After operating the machinery on the lode the waste water can readily be caught in a reservoir 1300 feet above Sutro, by means of pipes down shaft No. 2, and through the Comstock tunnel this waste water can be taken to Sutro, and it will have ample power to run a large-sized mill, with the aid of the water now coming out of the tunnel and available from other sources.

"With such a mill built at Sutro, and with economical facilities of getting the Brunswick ore to it, a vast amount of money might be saved in the reduction of this ore, and if large bodies of low grade ore are uncovered they can be worked on a paying basis, whereas, under the present arrangements, they could not. I am not a mining man and shall dictate no policy to anyhody concerning these matters, but it will be my earnest effort to bring these things about with the co-operation of the people."

ON THE COMSTOCK.—In the Crown Point mine the south drift from the tenth floor of the raise on the 700-foot level has not been advanced since last report, the time having been occupied in cutting out for square sets preparatory to the extraction of ore at that point. There is no particular change to note of the stopes above the 700-level. They continue to open out to the south on the fifth floor, and as high as the ninth floor, where the quartz is from 8 to 15 feet wide, running from $8 to $11 per ton, principally gold, and with a sharp strike to the southeast. Have extracted during the past week 612 tons and 710 pounds of ore, which was shipped to the Mexican mill for reduction. The average battery sample was $10.08 per ton, of which $8.95 was gold. Have shipped one bar of bullion, the June clean up, the par value of which was $22,182.61 and from which coin returns of $21,529.98 have been received, and the proceeds of 2720 tons of ore worked in June.

In the Belcher mine, on the 300-foot level, the joint Belcher and Seg. Belcher south drift is in 305 feet from the main shaft. The face shows quartz giving low assays. On the 1100 level the northeast crosscut is out from the north lateral drift 127 feet. The face is in quartz and porphyry. Hoisted during the week 43 tons of ore, the average assay of which was $22.17 per ton.

The yield of the Seg. Belcher mine for the week ending July 15th was 20 tons of ore, the car sample value of which was $26.53 per ton.

In the Challenge Con. and Confidence mines the west crosscut from the top of the joint upraise from the surface tunnel is out 110 feet. The face is in quartz of no value.

HUMBOLDT COUNTY.

The gold-hearing veins about Willow creek thus far discovered are of low grade, but often of immense size. Some are like quarries, and the ore at the very surface yields at the rate of $5 a ton. In the district are small veins and streaks of quartz that are much richer. Little attention has been given any of these. All prospectors go after the biggest veins in sight, and then they have something that they are unable to handle.

Recently a rich gold discovery has been made to the northward of the old town of Star City, at one time the big camp of the Humholdt country. The new find shows quartz so rich in gold that it can hardly be broken apart. The men who made this big find pack their ore down out of the mountains on the backs of mules, when it is loaded upon wagons and taken to the railroad.

The Star City people cared for no mines except such as carried silver; they did not hother with gold. The place is now utterly deserted. Only the ruins of some of the larger buildings and those of a few stone cabins remain to show where the town stood. At several points about the old town, and up and down Star canyon, are to he seen apple trees that are over thirty years old. This season all these trees are loaded with fruit. Old Star Peak, 10,000 feet high, looks down upon the camp as in the old days, hut of all those who once thronged the town not a man remains to look up at the peak.

The geology of that section, and of the whole Star range, shows that it is better for gold than for silver. Now that attention has been attracted to the region hy a big gold find, the old town may be peopled anew and new buildings may be erected among the ancient apple trees. Some are of the opinion that this Humboldt gold belt extends northward into Idaho. Parties from Idaho, scouting down into northern Nevada recently, report having found rich veins of gold-bearing quartz, and also some fine veins of copper. The copper veins also assay well in gold.

ESMERALDA COUNTY.

THE SALE OFF.—J. A. Yerington informed a Reno *Gazette* reporter that the sale of the group of mines in Silver Star district, which he had about concluded with Senator Wolcott of Colorado, is off. Senator Wolcott wanted to pay $100,000 and the balance when he worked it out of the mines.

While Mr. Yerington is a little disgusted over the outcome of a trade that he had every reason to believe was hased on sound business principles, with business men, and has done much work to bring capital into the district, he is by no means discouraged and the Wolcott fluke will rebound in advantage to the men who own the property. Very valuable discoveries are being made daily and instead of the group which comprised the supposed sale being worth $500,000, the syndicate who buys it will have to pay $1,000,000 for it now.

OREGON.

ON THE KLAMATH.—Several companies are opening up river claims in the Klamath above the mouth of the Shasta river, as well as below, all expecting to take out considerable gold this season.

SALE OF THE ASHLAND MINE.—The sale of the Ashland mine under the judgments of A. E. Kinney *et al*, aggregating $21,523.43, was made at Jacksonville last Saturday. The creditors, represented, made the purchase. It is understood that work will be resumed on the mine.

THE HAMMERSLEY PROPERTY SOLD.—Gold Hill *Miner:* Three months ago Morton Lindley bargained for the Hammersley Mining Co.'s property, situated on Jump-off-Joe, and located about twenty-five miles north of Gold Hill. The group of mines comprises Daisy, Little Dorrit, Lady Oregon, Coxey and Hopkins' Choice, and the property has been worked with successful results ever since the discovery of the property, some two years since. Mr. Lindley bargained for the property with the condition of placing on the property hoisting works and necessary machinery for working the mine for six months in order to test its merit. After a two months' run Mr. Lindley became satisfied that the property was all right, and, as a result, he and his associates have purchased the property outright.

WASHINGTON.

NEAR DAVENPORT.—A Davenport dispatch says: The Cleveland has fifty teams engaged in hauling the ore on the dump to Springdale. The company expected that the dump would have to be run through a concentrator before it would pay to ship it, but it has been ascertained that it is in great demand for fluxing purposes hy the smelters, and arrangements have been made whereby the smelting is done free of charge; hence the dump is being shipped bodily.

Del Hart, of Golden, Okanogan county, has gone to San Francisco to buy machinery for the Tribune mine of that place. Davenport parties are interested with him, and bope when improved machinery is put in place to handle the ore so that the profits of the mine will make them rich.

BRITISH COLUMBIA.

MINING ON TRANQUILLE CREEK.—Kamlloops *Sentinel*: P. Daly three weeks ago discovered good placer prospects on a bench of this creek, about thirty feet above the bed of the creek, the prospect in some cases going as higb as one dollar to the pan in fairly coarse gold. There have been located and recorded a number of hydraulic and placer claims. C. L. McCammon, of Vancouver, who located a hydraulic claim a short time ago, showed his proposition to a mining capitalist from Chicago who promised to lay the proposition before those who were interested with him on his return. They write that the deal bad been completed and that work on the claim would he started at once. There is said to be now no less than six hydraulic and over a dozen placer claims taken up in addition to those already located.

IDAHO.

AT THE CARIBOU.—The order of the Probate Court at Blackfoot, giving the Union Mining Company possession of the Caribou group, near Soda Springs, has been annulled by an order from the Judge of the District Court and the Idaho Mining Company is now in possession. Each side claims to have acquired its rights under a hond obtained from the owners. The Union Company claim to have paid over the amount of the bond to the owners. The Idaho Company contend that the Union Company defaulted, and that thereupon a bond was secured by their company. The Idaho Company is in possession, after its recent ejectment and the closing down of the mill, and the mill at the mines is again at work. The Idaho Company is handling about twenty-four tons daily. The ore is low grade, running between $5 and $6 per ton, but is found in great ahundance, and promises very handsome earnings for the company that holds the winning hand.

UTAH.

BOUGHT THE STEWART MINE.—J. K. Clark of the Moulton, Montana, has purchased the Stewart mine in Bingham. The Stewart is a low grade gold proposition and it is understood that Mr. Clark will treat the ore with the Murphy gold saving machine formerly in use at the Moulton.

MONTANA.

AROUND COLOMA.—Six thousand dollars was sent to Coloma last Friday to pay off the men working on the Mammoth mine. Coloma is now one of the most prosperous little mining camps in western Montana. Two 10-stamp quartz mills are working in the vicinity. The stamps are dropping with cheerful regularity on good ore, and the cleanups are said to he very satisfactory. There are hetween 250 and 300 men in the camp and surrounding hills. Many of these are prospectors working on their own claims, and the indications are favorable for another mill or two being erected within the next 12 months, says the *Missoulian*.

A GREAT YEAR.—*Inter-Mountain:* 1895 is going to be a great year in Butte. It takes a good many miners to produce 210,000,000 pounds of copper, but that is going to he the output. It means prosperity for 40,000 people. It means that more than $25,000,000 in copper, silver and gold will come from the mines of Butte before next January, and that most of it will remain here for labor and supplies.

SALE OF SUNRISE STOCK.—At Phillipsburg yesterday F. M. Durfee and F. W. Sherman have bought 127,000 shares in the Sunrise for $40,000.

WYOMING.

SPUR TO THE IRON MINE.—A party of Union Pacific surveyors is surveying a spur to the Iron mine, two miles north of Rawlins. The Iron Company is now shipping one hundred cars of ore per month to the Denver smelters, which will be doubled when the spur is completed. The ore is said to run $9 per ton in gold.

PLACER MINING CANAL.—E. A. Green of Providence, R. I., bas taken the contract for the construction of the West Side Placer Mining Company's canal, which will be thirty-eight miles long, and which will carry water to work the placer grounds of the company. Work on the canal will be pushed as rapidly as possible. In addition to the ditch work there will be 1,000 feet of flume and two miles of wooden pipe.

COLORADO.

BLACK SWAN MINING CO.—The Black Swan mine, on Silver Creek in the Burrows Park mining district, has been sold to a company of Toledo, Ohio, capitalists, who have organized as the Black Swan Mining Company, and will develop the property. Specimen assays of ore taken from the Swan have given returns of 370 ounces in silver and seven ounces in gold.

At Idaho Springs, Colo., in the west end of the lower level of the Amy C. mine, a solid streak of smelting ore eight inches wide has shown in the heart and it has carried this width of some distance. The ore runs from two to three ounces in gold, twenty-six ounces silver and some lead. This level is worked by leasers and last month four of them cleared $9 a day each after paying all expenses and high royalties. It is with a view of reaching this large body of high grade ore that the lower levels are being extended.

CHANCE FOR LOW GRADES.—Colorado Springs *Gazette:* Two years ago ore that would return less than $20 per ton was not considered worth shipping to smelters. It had to run through the stamp mills, where but forty to fifty per cent of the gold and silver was saved, and then sent to the smelters. Now the smelters bave reduced their schedule of rates to range from $3 to $7.50 per ton, making this the era of low grade ores.

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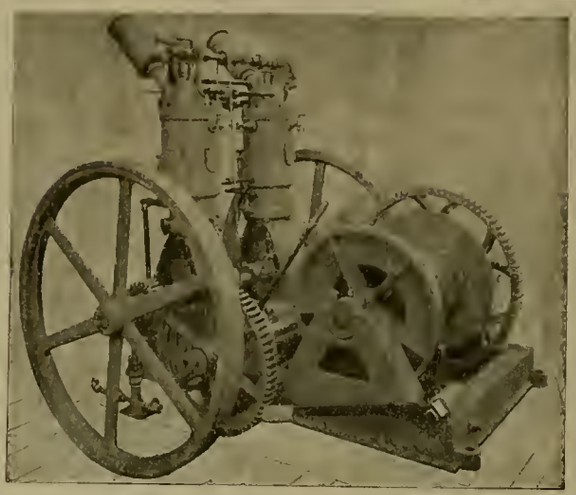
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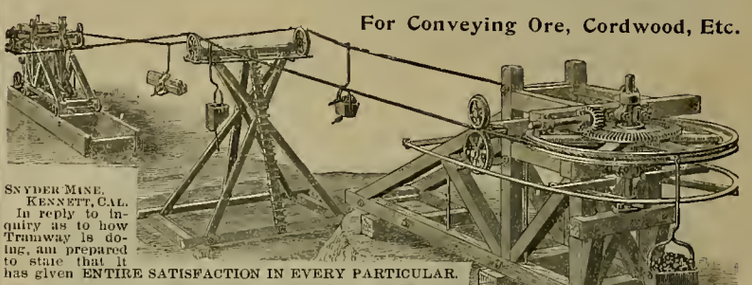
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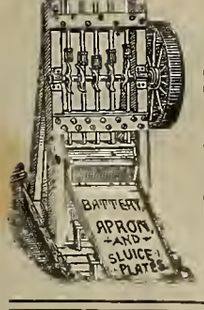
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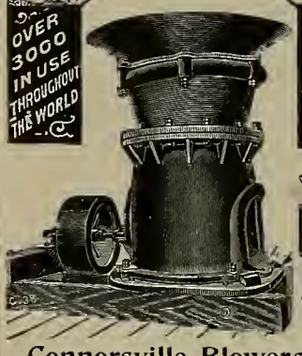
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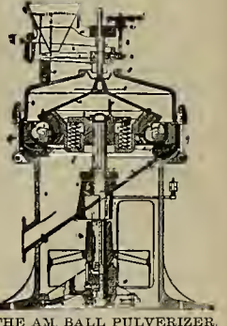
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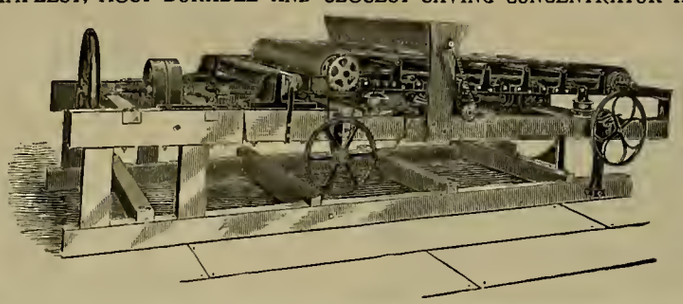
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SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1893.

THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully
E. L. BALLOU, Propr. Ballou Reduction Works.



NOTICE TO GOLD MINERS!

SILVER-PLATED AMALGAMATED PLATES

For Saving Gold

IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.

San Francisco Novelty and Plating Works

Incorporated.

SEND FOR CIRCULARS. 68, 70 and 72 First Street, San Francisco, Cal.

Justinian Caire, Agent

521 and 523 Market Street, San Francisco,

—DEALER IN—

Assayers' and Mining Material.

—MANUFACTURER OF—

BATTERY SCREENS AND WIRE CLOTH.

—AGENT FOR—

Hoskins' Hydro-Carbon Assay Furnaces.

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Rock Drilling, Air Compressing, Mining and Quarrying

Machinery.

23 Park Place, - - - - New York, U. S. A.

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ADAMANTINE SHOES AND DIES

—AND—

CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.



These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

Manufactured by CHROME STEEL WORKS, Brooklyn, N. Y.

H. D. MORRIS & CO., Agents, 141 and 143 First Street, San Francisco.

Special attention given to the purchase of Mine and Mill Supplies.



Stamp Cam.

H. D. MORRIS & CO., DEALERS IN MINING MACHINERY AND SUPPLIES.

141-143 First Street, San Francisco, Cal.

MANHATTAN RUBBER BELTING, PACKING AND HOSE,
SANDERSON DRILL STEEL,
MORRIS CENTRIFUGAL PUMPS,
LIGHT STEEL RAIL.

UNION IRON WORKS,
SACRAMENTO, ... CALIFORNIA.

ROOT, NEILSON & CO.,

—MANUFACTURERS OF—

STEAM ENGINES, BOILERS,

And all kinds of

✦ ✦ MACHINERY FOR MINING PURPOSES.

Flour Mills, Saw Mills and Quartz Mills; Machinery Constructed, Fitted Up and Repaired.

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SACRAMENTO, CAL.

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L. PETERSON, MODEL MAKER,

226 MARKET ST., N. E. Corner Front (Up Stairs), SAN FRANCISCO. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential.*

FRANCIS SMITH & CO.,

—MANUFACTURERS OF—

SHEET IRON & STEEL PIPE

FOR TOWN WATER WORKS.

Hydraulic, Irrigation and Power Plants, Well Pipe, Etc., all sizes.

130 BEALE STREET, SAN FRANCISCO, CAL.

Iron cut, punched and formed, for making pipe on ground where required. All kinds of Tools supplied for making Pipe. Estimates given when required. Are prepared for coating all sizes of Pipes with Asphaltum

DEWEY & CO., PATENT SOLICITORS.

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Business College,

24 Post Street, - San Francisco.

FOR SEVENTY-FIVE DOLLARS

This College instructs in Shorthand, Type-Writing Bookkeeping, Telegraphy, Penmanship, Drawing, all the English branches, and everything pertaining to business, for full six months. We have sixteen teachers and give individual instruction to all our pupils.

A Department of Electrical Engineering

Has been established under a thoroughly qualified instructor. The course is thoroughly practical Send for Circular. C. S. HALEY, Sec.

Market Reports.

The Markets.

SAN FRANCISCO, July 18, 1895.

The upward tendency in the metal market continues. Copper is particularly buoyant. The production of copper in tbis country in 1894 was 360,844,218 lbs., against 337,416,848 lbs., in 1893; increase, 23,427,370 lbs., or seven per cent; in addition, 6,635,844 lbs. were produced from imported pyrites.

Under date of July 1st, Jas. Lewis & Son report from Liverpool, England, as follows:

Copper. — Good merchantable copper has fluctuated within a range of £1 11s 3d per ton during the past month, falling from £43 15s to £42 3s 9d on the 11th ult., recovering to £43 on the 14th, only to fall again to £42 6s 3d on the 18th, due to an increase of 1560 tons in the English and Frencb stocks, advancing again to £42 12s 6d on the 24th, falling to £42 5s ou the 27tb, and closing to-day at £42 7s 6d, notwithstanding a further increase of 2161 tons in the stocks. This increase is mainly due to the large arrivals of Boleo copper—tbe production of six months—amounting to about 5139 tons fine. Prices in New York remain firm at 10.62½ to 10.75 cents per lb. for Lake and 10.50 for electrolytic, which are much above values here. Little or no American copper can consequently be obtained for shipment to Europe. Sixty tons Lake copper sold for a special requirement at £50 15s per ton, less 2½%, delivered. Tbree thousand three hundred and seventy tons of matte and 1470 tons of bars have arrived at Swansea from Boleo, also 2100 tons matte and 500 tons bars at Dunkirk. We understand that one-third of this company's production for this year bas been sold to Swansea smelters on a G.M.C. basis, and that the balance goes to French smelters. The deficient supply of small arms ammunition which brougbt about the fall of tbe late Government on tbe 21st ult., was estimated at 150 millions of cartridges, representing a consumption of about 2000 tons of brass. It is to be presumed that the new Government will take early steps to supply tbis deficiency. Imports are 343 tons, and deliveries 452 tons greater to date than duriug the same period of last year. The total arrivals in England and France for the montb have been 13,104 tons, and the deliveries 9383 tons fine. Stocks bave increased 3721 tons. The arrivals in England from Chile during the month have heen 1625, and the deliveries 693 tous fine, and from other countries 8365 aud 4969 tons fine respectively. The arrivals in England from tbe United States have been 878 tons bars, 41 tons ingots, and 1534 tons matte, equal to about 1733 tons fine copper, and in France 345 tons fine. The Cbile cbarters for the montb are advised as 2100 tons, and exchange 17¼d. Sales of furnace material have been confined to: June 11th, 110 tons ore, Portuguese, about 5% to arrive, Liverpool on private terms.

Quotations to-day are: Cbile bars and good merchantable copper £42 7s 6d for casb, and £42 13s 9d for three months' prompt, buyers. Englisb best selected ingots £46 to £46 10s, and Tough Cake £45 to £45 10s per ton. 8s 3d for ore of 20 per cent, and 8s 6d per unit for Chile Regulus or American matte, free from silver.

Gold.—77s 9d per ounce standard.

Silver has fluctuated between 30 9-16d and 30 3-16d per ounce standard, closing firm at 30½d.

Quicksilver from second bands is quoted at £7 8s to £7 8s 6d per bottle.

Sulphate of copper sells at £15 5s to £15 10s for prompt and forward delivery.

Lead.—£10 7s 6d to £10 10s per ton for English; soft Spanish, £10 6s 3d; rich in silver, £10 7s 6d to £11 2s 6d per ton; ore of 70 per cent, £4 4s 1d per ton and fine silver value. The import of silver lead from Mexico amounts to about 100 tons.

Antimony.—£31 10s to £32 per ton.

New York Metal Market.

NEW YORK, July 18.—PIG IRON—Scotch, 19@20c; American, 12@14c.

COPPER — Brokers', 10.75 @ 10.90c; exchange, 10.80c.

LEAD — Brokers', $3.15; excbange, $3.30.

TIN—Straits, 14.25@14.50c.

SPELTER—Domestic, $3.80.

New York Silver Prices.

NEW YORK, July 18.—Following are the closing prices for the week:

	Silver in—			
	London.	N. Y.	Copper.	Lead.
Friday	30½	66⅞	10 75	.....
Saturday	30⅝	67	10 85	3 12½
Monday	30⅝	67⅜	.....	3 15
Tuesday	30½	66⅞	.....	.....
Wednesday	30½	66⅞	10 75	3 12½
Thursday	30⅝	67	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
Londou Bankers' 60 days	$4.89¼
London Merchants	$4.87½
London Sight Bankers	$4.90¼
Refined Silver, per ounce	67c
Mexican Dollars, nominal	54¼c

San Francisco Metal Market.

COPPER.

Bolt	¼ & 5-16, 17c; ⅜ and larger,		16c
Lake Superior Sheathing	18	@	
Ingot, jobbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17

ZINC.

Sheet	8¼@		

LEAD.

Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75

QUICKSILVER.

Home trade, per flask	41 00	@	— —

TIN PLATE.

Per bx	5 25	@	6 00

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Belcher S M Co., Nev	51	25c	July 16, Aug 20, Sept 10	C L Perkins, Mills Building
Best & Belcher M Co, Nev	58	25c	June 12, July 18, Aug 10	M Jaffe, 309 Montgomery
Bullion M Co, Nev	45	10c	June 12, July 17, Aug 7	R R Grayson, 331 Pine
Challenge Con M Co, Nev	19	5c	June 11, July 16, Aug 6	C L McCoy, Mills Building, City
Cold Bar Cons M Co., Cal	1	2c	May 24, Jun 29, July 22	E C Godfrey, Crocker Building
Gould & Curry, Nev	76	15c	July 2, Aug 6, Aug 28	A K Durbrow, 309 Montgomery
Hale and Norcross M Co	107	20c	May 29, July 3, July 25	A B Thompson, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19, May 31, July 26	J Henry Smith, 431 California
Mono M Co, Cal	35	10c	July 16, Aug 15, Sept 10	M E Willis, 309 Montgomery
Occidental Con M Co, Nev	19	10c	June 25, July 30, Aug 21	A K Durbrow, 309 Montgomery
Ophir S M Co, Nev	66	25c	July 11, Aug 13, Sept 2	E B Holmes, 309 Montgomery
Potosi M Co, Nev	44	25c	July 14, Aug 14, Sept 4	C E Elliott, 309 Montgomery
Sonora Extended M Co, Cal	2	2½c	June 1, July 6, July 27	C A Stratton, 213 Jackson
Union Con	51	20c	June 18, July 19, Aug 15	A P Swain, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Lady Washington M Co, Nev	J E Jacobus, 309 Montgomery	July 31

PIG TIN.

Per lb	15	@	16 00

BORAX.

Refined, in car lots	—	@	5½
Refined, in sacks and barrels	—	@	5¾
Powdered, in car lots	—	@	5¾
Concentrated, "	—	@	4¾

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8	00	
Greta	7	00	
Nanaimo	6	50	
Gilman	6	00	
Seattle	6	50	
Coos Bay	5	00	
Cannel	8	00	
Egg, hard	12	50	
Wallsend	7	00	
Scotch Splint	7	50	
Brymbo	7	50	

TO ARRIVE—CARGO LOTS.

Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

COKE.

Gas Companies'	75c	@	bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —

Mining Share Market.

SAN FRANCISCO, July 18, 1895.

There was a little rise in the early part of the week, and a corresponding drop iu the latter. In the Comstocks this is accounted for hy the geueral tendency of the street to scariness. In the case of Bodie the drop was occasioned by one of the reports filed hy Messrs. Ryan and Gildea, who recently visited the Bodie Con. ou behalf of the dissatisfied stockholders. The former thinks that tbe Bodie Con. bas a good claim against the Standard for damages considerably in excess of tbe sum set in tbe suit; but the latter makes a very unfavorable report as to the present showing of ore in the mine.

The following illustrates the changes of the week:

Mines.	11	18
Alpha	$ 10	.....
Alta Consolidated	.....	.....
Andes	.....	$ 31
Belcher	37	33
Best & Belcher	64	96
Bodie	.....	20
Bullion	11	30
Challenge	.....	34
Chollar	73	61
Confidence	.....	.....
Consolidated California and Virginia	2 85	2 80
Consolidated New York	.....	.....
Crown Point	.....	41
Exchequer	.....	.....
Gould & Curry	43	46
Hale & Norcross	1 50	1 50
Justice	12	.....
Mexican	70	68
Ophir	1 55	1 40
Overman	22	20
Potosi	46	37
Savage	51	45
Sierra Nevada	63	58
Union	38	31
Utah	05	.....
Yellow Jacket	.....	42

San Francisco Stock Board Sales.

SAN FRANCISCO, July 18, 1895.

9:30 A. M. SESSION.

300 Bullion	20	100 Occidental	21
100 Challenge	34	100 Ophir	1 40
300 Gould & Curry	45	800 Overman	20
100	46	400 Savage	43
50 Hale & Norcross	1 45	100	44
100 Iowa	65	100 Union	30
100 Mexican	68		

SECOND SESSION—2:30 P. M.

200 Ophir	1 45	200 Yellow Jacket	42
200 Mexican	68	1000 Kentuck	03
250 Best & Belcher	96	300 Belcher	33
100 Con Cal & Va	2 80	50 Sierra Nevada	57
300 Savage	45	150	58
300 Chollar	61	300 Union	31
100 Potosi	37	100 Caledonia	14
350 H & N	1 50	100 Andes	31
200 Crown Point	41	100 Bullion	20

WANTED!

To Rent or Buy

A DIAMOND PROSPECTING CORE DRILL

FOR UNDERGROUND WORK.

Complete, in working order. To be run by compressed air and drill from 300 to 1000 feet. Give terms or spot cash price, and all particulars at once. "The Sullivan" preferred.

BOX NO. 23, CRESCENT MILLS, PLUMAS COUNTY, CALIFORNIA.

Assessment Notices.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 25th day of June, 1895, an assessment (No. 19) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of July, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 21st day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

GOULD AND CURRY SILVER MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees, held on the second (2d) day of July, 1895, an assessment (No. 76) of Fifteen (15c) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Sixth (6th) day of August, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the Twenty-eighth (28th) day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California; location of works, Inyo, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 5th day of July, 1895, an assessment (No. 27) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 12, rotunda, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 8th day of August, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 4th day of September, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

W. W. SARGEANT, Secretary.

Office—Room 12, rotunda, Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

GOLD BAR CONSOLIDATED COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 24th day of May, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
John E. Todd	5	2,500	$ 50 00
John E. Todd	6	2,500	50 00
John E. Todd	9	2,500	50 00
John E. Todd	55	2,500	50 00
Jas. P. McCarthy	13	625	12 50
Jas. P. McCarthy	63	2,500	50 00
Jas. P. McCarthy	64	2,500	50 00
Jas. P. McCarthy	65	2,500	50 00
Jas. P. McCarthy	66	2,500	50 00
W. A. H. Connors	14	625	12 50
W. A. H. Connors	52	1,800	36 00
John H. Page, Trustee	22	500	10 00
John H. Page, Trustee	23	500	10 00
John H. Page, Trustee	84	9,000	180 00
C. A. Moore, Trustee	28	5	10 00
C. A. Moore, Trustee	29	4,995	99 90
C. A. Moore, Trustee	32	16,666	333 32
I. N. Pattisou	53	1,000	20 00
J. S. Herron	41	300	6 00
E. C. Godfrey, Trustee	54	6,000	120 00
E. C. Godfrey, Trustee	57	1,000	20 00
E. C. Godfrey, Trustee	58	500	10 00
E. C. Godfrey, Trustee	59	500	10 00
E. C. Godfrey, Trustee	60	200	4 00
E. C. Godfrey, Trustee	85	2,500	50 00
E. C. Godfrey, Trustee	86	4,000	80 00
Louise V. Rugg	36	10,000	200 00
A. U. Rugg	38	16,667	333 34
F. R. Harris	42	1,000	20 00
F. R. Harris	43	1,000	20 00
F. R. Harris	44	1,000	20 00
F. R. Harris	45	1,000	20 00

And in accordance with law, and an order from the Board of Directors, made on the 24th day of May, 1895, so many shares of each parcel of such Stock as may be necessary will be sold at public auction at the office of the Company, Room 37, Crocker Building, corner Montgomery and Market streets, San Francisco, California, on Monday, the 22nd day of July, 1895, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

E. C. GODFREY, Secretary.

Office—37 Crocker Building, San Francisco, California.

DELINQUENT SALE NOTICE.

H. P. TAYLOR MINING COMPANY. — Location of principal place of business, San Francisco, California. Location of works, Liberty Mining District, Siskiyou county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 19th day of April, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
William Patterson	7	12,492	$499 68
Howard P. Taylor, Jr.	8	12,493	499 72
J. Henry Smith	9	12,492	499 68
Howard P. Taylor, Jr., Trustee	10	12,498	499 92

And in accordance with law and an order from the Board of Directors made on the 19th day of April, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 39 Merchants' Exchange, 431 California street, San Francisco, California, on FRIDAY, the 26th day of July, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

J. HENRY SMITH, Secretary.

Office, Room 39 Merchants' Exchange, No. 431 California street, San Francisco, California.

ANGELS IRON WORKS,

DEMAREST & FULLEN, Props.

Mining Machinery.

ANGELS, CAL.

Write for estimates on complete Milling, Mining and Reduction Plants.

THE OLD RELIABLE!



ALBANY

LUBRICATING COMPOUND

TWENTY-SEVEN YEARS' CONTINUOUS SERVICE in the great Mines, Steamships, Railroads and Mills all over the world prove it to be

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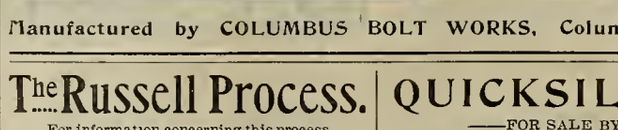
Tatum & Bowen

34-36 FREMONT ST., SAN FRANCISCO.

85 FRONT ST., PORTLAND, OR.

DEALERS IN MACHINERY, OILS, MINING AND MILL SUPPLIES, ETC.

DROP FORGED MINER'S SPOON. Sample by Mail, 10c.



THIS CUT ONE-HALF SIZE.

Manufactured by COLUMBUS BOLT WORKS, Columbus, Ohio.

The Russell Process.

For information concerning this process for the reduction of ores containing precious metals, and terms of license, apply to

THE RUSSELL PROCESS CO.,

Park City, Utah.

QUICKSILVER!

—FOR SALE BY—

The Eureka Company,

OF SAN FRANCISCO.

ROOM 1. - 426 CALIFORNIA STREET,

SAN FRANCISCO.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 9, 1895.

542,433.—CAN LABELING MACHINE—Henry Albert, Cresceat Clty, Cal.
542,516.—AIR VALVE—T. W. Brooks, S. F.
542,438.—FRUIT WASHER—L. R. Butler, Lamanda Park, Cal.
542,555.—SASH FASTENER—W. H. Dean, West Berkeley, Cal.
542,550.—CLOTHES DRIER—J. Drum, Spokane, Wash.
542,441.—CAR CRIMPING MACHINE—J. Gould, Jr., Berkeley, Cal.
542,443.—DRAFTING INSTRUMENT—J. S. Hand, S. F.
542,559.—WEDGE—W. I. Harmon, Mt. Vernon, Wash.
542,366.—WHISTLE AND CIGAR HOLDER—L. Lemos, S. F.
542,421.—CUT-OUT VALVE—A. J. McNicoll, S. F.
542,535.—BRACKET—C. Pettit, Tucoma, Wash.
542,597.—CAR COUPLING—V. Pfuff, S. F.
542,495.—CAR COUPLING—Potts & Daniel, Prescoll, A. T.
542,376.—DISINFECTING APPARATUS—Scott & Bradshaw, S. F.
542,429.—PROCESS—E. A. Starke, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ELEVATOR CUT-OUT VALVE ATTACHMENT.—Andrew J. McNicoll, S. F. No. 542,421. Dated July 9, 1895. This invention relates to an attachment for elevators. It consists of a cut-out valve attachment or plunger, which moves in the same direction with the hydraulic cylinder piston and cross-head, so that the cut-off is produced by a direct closure in either direction, without any reverse mechanism. The cylindrical valve chamber has closed ends and stuffing boxes for the passage of a valve rod, the valve which if fixed to said rod being movable loosely in its chamber parallel with the main hydraulic cylinder, said valve being open at both ends for the free passage of water through the valve, whereby it is balanced, and it has an intermediate port normally corresponding in position with the transverse passage made through the valve chamber, and connecting the main cylinder with the source of supply. In conjunction with this is an extension of the valve rod, having fixed collars and an arm fixed to the piston rod; a cross head adapted to strike the collars and move the valve in the same direction with the piston without intermediate levers. Means connected with the valve rod return the valve to its normal condition when the main supply valve is open.

CAN LABELLING MACHINE.—Henry Albert, Crescent City, Cal. No. 542,433. Dated July 9th, 1895. This invention relates to a can labelling machine. It consists of a paste-container situated at one end of the machine, having a horizontal, movable platen adapted to travel above it, and rollers whereby the paste is delivered from the container upon the under surface of the platen, a can-puller adapted to receive cans from the supply chute and to roll them in a horizontal runway above a chamber containing labels which are to be applied to the cans, a paste roller, vertical reciprocating paste heads, movable above the ends of the labels, so as to apply paste alternately to these ends, a paste roller movable by the can-puller and adapted to roll beneath the paste-heads when the can-puller is reciprocated, a mechanism whereby the can-puller and the platen of the paste receptacle are caused to reciprocate in opposite directions, so that the paste is delivered from the platen upon the paste roller of the can-puller when the two approach each other, and is delivered from the paste roller upon the paste heads when the can-puller returns. The machine embodies various details and improvements, by which its efficiency and accuracy is greatly increased.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from E. C. Kendall et al., in the Sharp Mine, near Brandy City, Sierra Co., to impound tailings in Sharp Ravine, an old pit, and on the bank of the north fork of the Yuba River; from W. R. Atkinson et al., in the Homestake Mine, near Gold Lake, Sierra Co., to impound tailings in a ravine; from Toland & Landon, in the Corkscrew Placer Mine, near Spanish Ranch, Plumas Co., to impound tailings in ravine below the mine and on bank of Spanish Creek; from Henry Goerling, in the Last Chance Mine, near Gold Lake, Sierra Co., to impound tailings in a dry ravine; from James Chapelain, in the Chapelain Quartz Mine, near Rackerby, Yuba Co., to deposit tailings in Honcut Creek; from Luigi Lagomarcini, in the Romie Mine, near Loganville, Sierra Co., to impound tailings in an old pit; from T. T. Kirkham, in the Big Ravine Mine, near Blue Tent, Nevada Co., to impound tailings in ravine below the mine; from the Interior Development Co., in the Brown Placer Mine, near Michigan Bluff, Sacramento Co., to impound tailings on flat ground near Arkansas Creek; and from the Cascade Water and Mining Co., in the Cascade Mine, Beckwourth Tp., Plumas Co., to impound tailings in Grizzly Creek, gives notice that a meeting will be held at Room 62, Flood building, San Francisco, Cal., July 29th, 1895, at 1:30 P. M.

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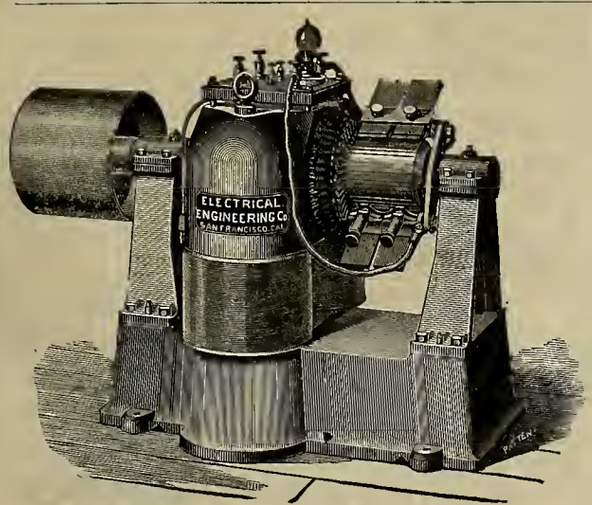
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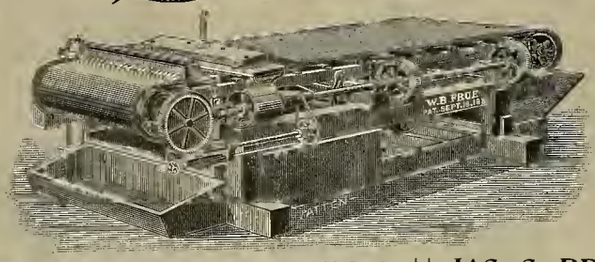
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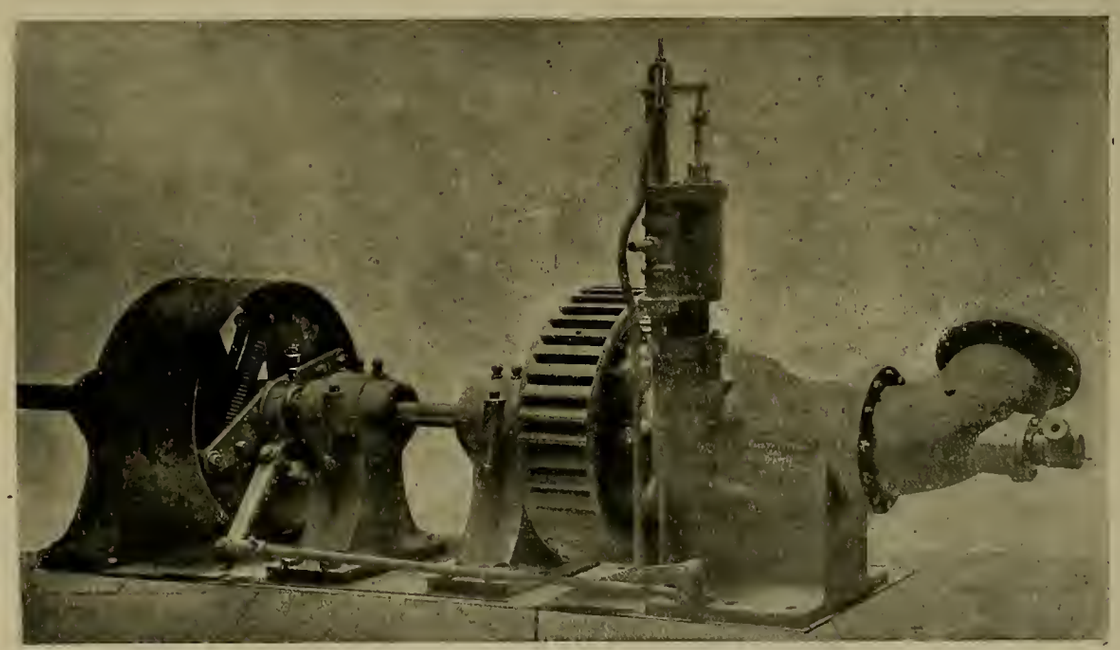
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Recent Installation at Ontario, Cal.

The accompanying illustration shows one of two Girard water wheels which have just been installed at Ontario, Cal. Both wheels are for driving electric dynamos, one of the dynamos being for lighting and the other for operating the Ontario Electric Railway. The plate shows very plainly the details of the wheels, with the governor and hydraulic cylinder to operate the gate. The supply for the cylinder is taken from the pipe line, so as to be always ready for operation even though the wheel is not running. The governor operates a balance valve through the connections shown. Adjustments are provided in several places to control the various elements of the movement. The wheels take their supply from a common receiver through the pipe shown. The bearings are made self-oiling and self-adjusting to insure smooth running and perfect lubrication. The shafts are of steel and all parts are heavy and well finished.

The sole plates on the concrete foundations are not shown in the cut, but there is one for each stand and one under the gate.

The office and works of the Girard Water Wheel Co. are at 34 and 36 Main street, San Fraucisco.



GIRARD WATER WHEEL AT ONTARIO, CAL.

A Development Company.

"Buying and Selling Mines" is the caption given some recent interesting correspondence in this paper on that subject. There is no matter of more present importance than this. Upon its correct handling depends largely what turn the industry will take in this new era which has already begun. It has been cleverly said that there are two classes of men in the world—those who do things and those who afterward sit back and tell how those things should have been done. This is particularly noticeable in the mining world, where precedent and tradition go a long way. This is not a question of hide-bound beliefs. It is for those who are willing to back reasonable opinion by the argument of action to go ahead and succeed. The idea all along has too largely been to let the prospector work out his own salvation; to have little to do with anything but "a going concern," that is, a mine that has paid or is paying expenses in active operation, with a promise of continuance. That on the one hand. On the other, a desire to have a hole in the ground looked upon as a valuable property, and an assay from an outcropping accepted as evidence of value justifying the figure asked. There is now under discussion a proposition that appears to be worthy of commendation; it is not the sole idea to either "buy" or "sell" mines. It is more an outgrowth or manifestation of the new spirit of the times to develop the resources of the commonwealth. It being plainly evident that mining for gold has assumed uuusual prominence and that California is the best section of the universe in which to mine for gold, the idea is to practically combine in this State modern metallurgy and mining methods with modern business methods; to have mine development and cooperation with mutual profit. Under existing conditions in a majority of cases the individual owner of a mine is not in financial fix to show its value, and the "promoter" is an expensive factor. It is proposed to eliminate this gentleman and deal more directly. An organization provided with capital, able to expert a proffered property, furnish the requisite machinery for development and demonstrate the value of the mine, assuming the entire cost, standing the loss if any, and sharing in the probable profit, would be of service to the State and of euormous value to its undeveloped mines. Intelligent management of such an organization would reduce the risk to a minimum and help others in helping itself. In every department of the world's work the old systems have become obsolete. In every branch of successful business new methods are being adopted. There is no disturbance in "the eternal fitness of things." The same abstract principles survive and govern, only the application differs. In mining, the old, easy, "days-of-'49" period is ended. The millions that Califoruia has contributed to the world's permanent wealth are but an index of the vastly greater amount possible to be produced in the manner indicated.

Reports from Curro del Oro, Mexico, are to the effect that 200 miners there employed becoming enraged against their employers struck work, captured and fortified the neighboring town, and defy all authority.

South African mining companies are still in great favor in France and England, and the London mining papers think the boom will last the year out anyhow. Current issues to hand give accounts of several just formed: one, the "Rights and Exploring of Rhodesia, Lt'd," has £100,000 capital stock, has the right to locate 100 claims in Matabeleland, and has paid £25,000 for property. Shares "are confidently offered for £1 each," and editorially endorsed. In connection with this editorial puffing of mines and mining prospectuses, now so common in British mining journals, no less a paper than the *Pall Mall Gazette* deems it necessary to utter a word of warning. It says: "Day by day it becomes more necessary to issue an earnest warning to the public, both in London and the provinces, to beware of the items of mining news put before them in their newspapers. Such reports should be treated with the utmost scrutiny—not implicitly relied upon because they are contained in the pages of an apparently respectable newspaper. Many of these reports, which to the uninitiated reader may appear to be written under the direction of the editor of the newspaper in which they appear, are nothing more than advertisements, and they are advertisements which should be regarded with the utmost suspicion, from the mere fact that they do not pose as such. These puffs are written by the officials of the companies themselves, and their insertion is obtained in the editorial columns by payment—sometimes heavy payment. A reader is often led to believe that a company must have some status, or it would not be so frequently referred to in the journal to which he subscribes. As a matter of fact, it may be that the company merely adopts the rapidly extending practice of making up for lack of status by payment for notice in the news columns of these journals. We know, we regret to say, of at least one list in existence containing the names of over 100 newspapers in London and the provinces whose editors are prepared to sell space in their news columns for the reception of these company notices written by the officials of the companies themselves." It has long been manifest that there are very few journals publishing mining news in England whose opinions could not be bought, and that the fact is now so plainly stated there may tend to stop the publication of wholesale puffery and paid reading matter that is invariably declined by a respectable paper or one that has any regard for public interests.

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J. F. HALLORAN.....General Manager

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A COLORADO mining broker who has been operating in London and Paris says: "In investing in the United States, foreigners fear most the legal complications which our system of location and apex decisions render so frequent."

ELSEWHERE is given a partial report of the proceedings of the commission of the high court of justice of the Transvaal Republic, which is engaged in taking testimony in Great Britain, Australia and the United States in an effort to determine where cyanide was first employed in the reduction of gold ore. The commission will come no farther west than Salt Lake City. The litigation which gave rise to this commission is extraordinarily costly, several hundred thousand dollars being thus far entailed as costs, making it famous in the list of great patent cases. Yet it is possible that the decision will be indeterminate.

THE new tariff as affecting imported lead ores provides that they shall be "sampled and assayed at the port of entry, according to commercial usage." The Treasury Department asked for bids for this work, and when opeued last Saturday it was found that there were but two proposals, both from El Paso, Texas, both for sixty ceuts per ton. The paucity of proposals—there being fifteen points from which no bids were received,—makes it possible that no effort will be made to depart from the old method, or, rather, lack of method, in this regard. So little lead is imported here, and the little brought from Mexico is so economically handled, that the matter is of little local interest.

CECIL RHODES, the head of the British South Africa Co., is frankly original. Having been asked how his company was going to be reimbursed for its expense in partially explored Mashonaland and Matabelelaud, he said: "By means of a patent. The principle that the company shall get a share of the vendors' scrip has been practically accepted by the country. We have not had the slightest difficulty in settling with the various corporations who have obtained capital from the public. The great objection to the idea was its newness; it had never been done before. It has now been tried, aud has been accepted and for a very simple reason: the prospector has found that he is not eaten up by the monthly licenses while he is holding his claims. The capitalist, when he goes to purchase, knows the charter has a certain interest and pays accordingly, and as to the public, who always find the working capital for quartz reefs, it is a matter of no importance to them whether Jones gets the whole of the vendors' scrip, or whether Jones and the Government share it together. The public do not take such a personal interest in Jones that they desire him to have the whole of the vendors' scrip, and they, at least, know this—that if a half of it goes to the Government it is put away until the proved development of the mine, whereas, perhaps, if it were held entirely by Jones, he might part with the whole of it to a confiding public." That is on the proposition that they shall take who have the power, and they shall keep who can.

The Case Appealed.

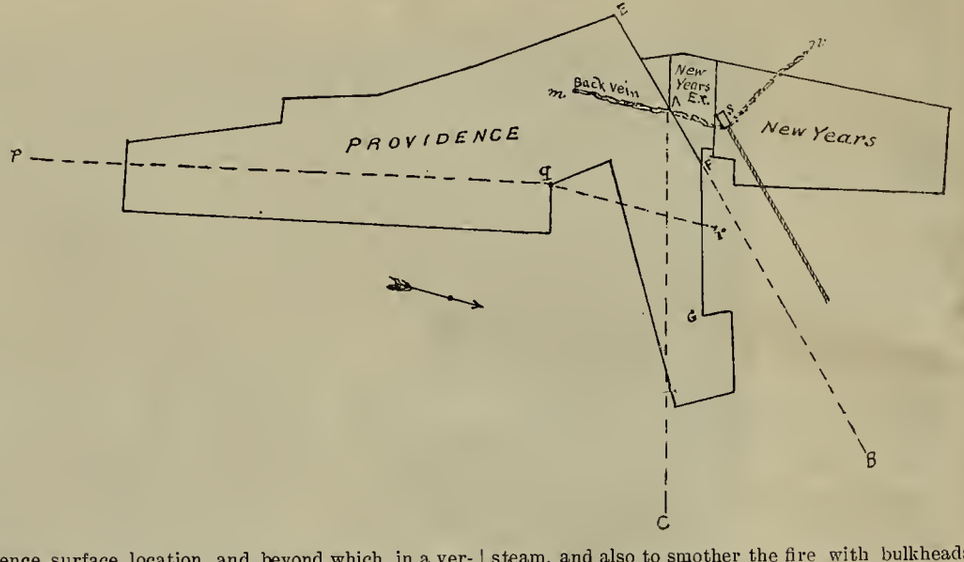
On August 13th, '94, a decision was read by Judge Beatty, being that of Judge Hawley in the U. S. Circuit Court in the case of A. Walrath, of the Providence mine, vs. the Champion Mining Co., from which the complainant has appealed, the appeal being filed this week in the U. S. Circuit Court of Appeals in this city, thus reopening a very interesting and important mining suit over valuable property in Nevada county, involving many points of interest to the mining world.

The suit was for $300,000 damages for ore alleged to have been mined by the Champion people on the Providence ground, and for an injunction. After an elaborate statement of the case the judge, in discussing the line F–G, said:

"There is nothing in the facts of this case which gives to complainant any right to extend that line—as a boundary line—any farther than the point G, at which point it comes to the line G–H, which, as before stated, is the northerly end line of the Providence surface location, and beyond which, in a vertical line drawn downward, the complainant had no right to any part or portion of the 'back' vein, either by virtue of the Providence location, patent, Act of 1872, or any agreement or estoppel between the parties. Let a decree be drawn designating the boundary plane fixing the rights of the parties in conformity with the views expressed in this opinion for a perpetual injunction, and for an accounting, if so desired; each party to pay their own costs."

It is from this decision that the appeal is made. The arguments, the claims of both sides, very complete maps of the ground in dispute and the full text of the decision were published in the issues of this paper of June 30, and August 25, 1894.

(In the accompanying sketch the line E. F. B. is the one claimed in the original suit by the Providence; the line A. C., the one claimed by the Champion; the line F. G. shows the boundary fixed by Judge Hawley in the decision, from which appeal is taken.)



COMMISSIONER LAMOUREX of the General Land Office is credited in a Washington dispatch with saying: "I am paying no attention to any protests, no matter from where they come." That is hardly so; he has been overruling protests from the Miners' Association, and from his actious and language is apparently as much of a railroad attache as any other man in its employ, being doubly valuable by reason of his high official position. The idea that he probably meant to convey may be that he does not intend to allow the miners or any one to check his official collusion in the work of wholesale corporate absorption of the mineral area of the State. During the week his dismissal of the protest against the issuance of a patent to the S. P. Co., of 24,901 acres of mineral land in the Los Angeles district, has been appealed from by the chairman of the committee on mineral lands, who in his brief argues the case under the provisions of the rules of the Secretary of the Interior of July 9th, 1894. The argumeut shows plainly that Commissioner Lamourex, who pays "no attention to any protests, no matter from where they come," is guilty of usurpation of power, and that were he to get his just deserts he would at least cease to hold the position he so unworthily fills. The brief is a valuable contribution to this tedious business and will be in the hands of the Secretary of the Interior by the first of next month.

AT 8 P. M., JULY 21, fire started from a miner's candle in the north stope of the Stickle mine, between the Stickle and South Utica shaft between the 800 and 900-foot levels. The property at Angels, Calaveras Co., is the greatest gold-producing mine in the United States, employing hundreds of men, and turning out over $6,000,000 yearly. The men were hoisted through the three shafts without any loss of life. The man in charge, Supt. Lane, showed his nerve and courage. He first saw that everything was done to get the men out; learning that seven men were on the 1100-foot level in danger of suffocation, he, with one assistant, went down into the depths of smoke and gas and flame, found them and got them out in safety. He then tried to force in steam, and also to smother the fire with bulkheads, but that being useless, he ordered the mine flooded, and soon 1300 inches of water were pouring in on the burniug forest of underground timber. Great quantities of immense timbers have been used, it being one of the most heavily timbered mines in the world. The shafts were bulkheaded and all possible vents closed; the water rose in the mine five feet an hour, and before noon on the 23rd the fire was drowned out, the shafts opened, the mine freed from gas, and the pumps at work. The water rose to the 700-foot level, and sufficient ore is procurable, above that, to keep the 120-stamp mill going till the mine is pumped out, which will probably be twenty days. It is thought $30,000 will cover the damage.

A DISTINGUISHED JURIST of this city makes further claims to fame in a novel plea which he advances to the effect that the U. S. Circuit Court of Appeals has no jurisdiction in Alaskan matters. There is a case—the Silver Queen Mining Co. vs. Mrs. Noyes—originally won by a jury trial in Alaska, and now appealed by the latter, the defeated party, to the U. S. Circuit Court of Appeals. The defense moves to dismiss on the ground that that court has no authority because of no jurisdiction; that any legal decision in Alaska is final; there is no appeal; that the Alaskan court is not a constitutional tribunal from which an appeal lies to the U. S. Circuit Court of Appeals, as Congress has provided no jurisdiction as to appeals from that territory. It is probable that it will be found that Alaska, which is a territory of the United States, stands in such matters just as do the other four wards of the nation and that the appellate court has similar jurisdiction.

Concentrates.

THE Blossom mine in Yuma Co., Arizona, is about to be reopened.

DURING June the gold export from the Cape country, S. A., was £990,493.

THE pay roll of the Zeila mine, Amador Co., aggregates $9,000 per month.

THE Calaveras mine, near Sheep Ranch, which has long been idle, is to be reopened.

A 10-STAMP MILL will be put up next month at the Osborne mine, near Westville, Placer Co.

TWO HUNDRED working miners have agreed to organize a miners' union in the Trail Creek, B. C., district.

AT the Mayflower mine, near Nevada City, a 20-stamp mill is building and 3000 feet of water pipe being laid.

THE Rawhide mine is assessed at $222,000; the Utica, $671,000; the Kennedy, $325,000; the Keystone, $29,000.

E. J. MURRAY, of Redding, is the new superintendent of the Green Mountain mine mill, Crescent Mills, Plumas Co.

THE Merrimas, Nevada Co., Company have leased the Pittsburg mill to crush their ore, of which they have plenty.

MOODY & GRANT of the Four Hills mine, near Johnsville, Plumas Co., have let a contract to run 800 feet of tunnel.

GEO. MONTGOMERY, of this city, is about to put a new forty-stamp mill on his Trinidad mine, at Sailor Canyon, Placer Co.

TRINITY COUNTY has not been overlooked by the State Mining Bureau, but will shortly be visited by Mr. E. B. Preston.

LOS ANGELES mining men are visiting the Santa Fe, Riverside Co. mine with a view to buying an interest in the property.

"OUTSIDE" capital is being placed in Russian gold property, several French capitalists having become interested in Ural mines.

THE Nogales, Arizona, *Oasis* declares that gold ore going $200 to $300 a ton is being taken from the Mascot mine in Yavapai county.

SINCE Jan. 1, '95, the West Kootenay mines, according to the Nelson *Tribune*, have shipped 13,415 tons of ore valued at $1,210,072.

THE Greenhorn blue gravel mine has shut down owing to scarcity of water, after a good season's run, and will resume in November.

A HARTFORD, CONN., dispatch says that the Bristol Copper and Silver Mining Company will stop the pumps and allow the mine to fill up.

VIC DORSEY, who is something of an electrician himself, has put in an additional electric light outfit in the Maryland mine at Grass Valley.

T. M. LANE has a five-stamp mill and ten men at work at the Pena Blanca, below Rawhide, recently bonded by Hayward and Lane.

E. H. BENJAMIN will personally superintend operations at the quartz mine he and associates recently bought near Granite Basin, Plumas Co.

THE suit for the recovery of $11,094, amount of wages due employes of the Lockwood mine, has been transferred from Calaveras county to this city.

WILLIAM MARSHALL, while working alone in a mine on Pioneer creek, five miles above Volcano, Amador Co., was caved upon and killed last Tuesday.

THE Dake smelter site on Lynx creek in Yavapai county, Arizona, has been bought by Colorado men, who will build a mill for the treatment of custom ore.

IT has been decreed by the Queensland Government that imported mining machinery shall pay 25 per cent duty; that's the kind of "home industry" people they are.

THE British South Africa Co. has increased its capital stock by issuing 500,000 new shares at £1 each. They are offered at seventy shillings—a premium of £2 10s—per share.

AT the Holmes and Georgene mines, Candelaria district, Nevada, work will be resumed about September 1st. The plant to work the Belleville tailings is not yet built.

AFTER considerable backing and filling the Rawhide deal is off, and Messrs. Nevills, Martin and Billard will, themselves, develop that famous property to a depth of 2500 feet.

THE Omaha Gold Mining Company last week declared dividend No. 33: 15 cents per share. Geo. Maiuhart, the superintendent, is having considerable development work done.

THE *Tribune* says the Niagara tunnel has now pierced the mountain 2589 feet, where the drills are gnawing into the hardest kind of rock. Meanwhile both mills are running on ores.

THE Tres Amigos mine at Oro Blanco, Arizona, is reported showing up finely. The shaft is down 100 feet on a five-foot vein, the ore being free-milling gold of low grade, but profitable.

THE owners of the Thistle shaft, at La Porte, employing 105 men, are discussing the proposition of establishing two additional plants to open up the property from the Plumas county side.

THE *Monitor Sinaloense* bears that Senor Francisco Peraza, of San Jose de Gracia, has sold his mine in Sinaloa, the Santa Tomas, to the Anglo-Mexican Mining and Milling Company for $150,000.

THE United States Debris Commission last Monday granted a permit to the proprietors of the Charcoal Ranch mine, near Sierra City, and to D. O'Keeffe for a dam for his mine in that vicinity.

J. ISGRIG and R. A. Heim have bought the plant of the Mammon Gold Mining Company at Otis, Pinal county, Arizona. They intend to open up the mine at once, and put in a mill later.

THE Kinkead Milling and Mining Co., a Nevada State corporation, has bought the waste dumps of the Con. Cal. & Va., at Virginia, Nev., and intends building a concentrating plant of 100 tons daily capacity. They claim to have a process by which they can make money out of such immense waste heaps as dot the Comstock. The idea appears feasible.

A FOUR-FOOT vein of magnetic ore is said to have been discovered in Big Bug district, Yavapai county, Arizona. The ore is reported a fine flux carrying about $10 per ton in gold and silver.

THE *Ledger* says that the gross output of the Utica Mining Company at Angels for June was one million dollars, nine hundred thousand of which was paid out to the stockholders in dividends.

J. B. SELLIER is driving a tunnel at the Mountain Chief mine in just expectation of striking the same gravel channel now being mined by Supt. Power at the Sunny South, two miles distant.

THE Cincinnati Belle mine, located between Perris and the Good Hope, Riversido county, is reported to be showing up a good body of paying ore. They are down 100 feet and drifts are being run.

THERE never was so much activity in mining in Montana as at present. That seems to be the general opinion of mining men, mining brokers and dealers in mining supplies, says the Helena *Independent*.

AT Florence, Arizona, a trial run of a thousand tons of ore from the Ripsey mine is going to be milled. If the experiment proves satisfactory a ten and perhaps a twenty-stamp mill will be erected.

VICE-PRESIDENT SHAUGHNESSY of the Canadian Pacific railroad has been visiting West Kootenai, and says his company will probably construct several branches and give facilities for transporting ore.

A 114-FOOT tunnel is being run in the Eagle mine, near Grizzly Flat, El Dorado county, and if, as is confidently expected, a good body of ore is struck, it is the intention to build a twenty-stamp mill.

DURING the year ending June 30, '95, 212 barrels of sweepings were collected at the U. S. mint in this city, and sent to the Selby Smelting Co., who, last Tuesday, sent Superintendent Daggett $6370, net results thereof.

DR. BOYSON of the Pioneer mine is going to France, and it is probable that before his return he will have transferred some Amador county gold property to Messrs. Choisy and De Bourgade, who lately visited that vicinity.

THE Helena assay office last Monday received the biggest single deposit of gold dust ever made there, being over 3000 ounces, worth $54,000, being the first shipment for the season from the placer mines on the Yukon, Alaska.

H. A. STEVENS has twenty-six placer claims, of 20 acres each, on the north side of Josephine creek, Oregon, some of the gravel in which goes 60 cents per yard, and proposes to spend $17,000 in ditching and getting ready to work.

THIS week a 24-ton capacity Huntington mill was shipped to O. B. Amsden, Supt. Gold Bug mine, who will put it in operation about one mile above Brown's mill. The engine is 30 H. P. The mill will treat Gold Bug and custom ore.

THE Horseshoe Mill Power and Mining Company has incorporated at Merced; capital stock, $50,000; A. G. Clough, G. E. Nordgren, O. F. Giffin, Merced; J. F. Thorn, J. J. Marshall, Hornitos. The property is in Hunter's valley, Mariposa Co.

THIS time it is Prof. Hunicke of the Washington University, St. Louis, who is applying for a process by which, he claims, $10,000 worth of gold can be obtained from sea water at a cost of $1, every ton of water yielding from 2 to 4 cents' worth of gold.

THE Nevada Co. Electric Power Co. figures its ability to furnish power to mines in Nevada and Placer counties for $100 per H. P. annually. The plant now in process of construction is intended to develop 2500 H. P., and will cost about $75,000.

THE Arizona mining papers, as an aftermath of the silver "boulder" near Peach Springs, are having a discussion as to the weight of a ton of pure silver at one dollar per ounce. The statements vary from $80,000 to $29,160, which last, so far, is nearest the fact: $24,000 would be still nearer.

PLUMAS COUNTY'S ancient river channels are again attracting attention. Some San Jose men, including Tyler Beach, are about to develop the Elizabethtown channel, and Messrs. Doolittle and Sharon have the Franklin and Beckwith Consolidated bonded for $150,000.

EXTENSIVE preparations to work the placer claims of the Monitor Mining and Investment Company at Gila City, Yuma county, Arizona, have been completed. The company intends adding to its present hydraulic plant and sluicing the auriferous gravel of that section for all there is in it.

THE executive committee of the State Miners' Association met in this city last Monday evening. The question of funds was discussed and a recommendation made that the committee on protection of mineral lands take action toward getting the whole matter before Congress at its next session.

THE Poorman, Idaho, mine is just about making expenses, owing to the low-grade character of the ore and the low prices of lead and silver. There is a debt hanging over the property which the owners hoped to pay off by keeping the property in operation, but some of the owners are in favor of closing down.

THE statistics of the California gold yield for '94, by counties, exhibit a handsome increase, aggregating a million dollars more than that of the preceding year. As before published, the total is considerably over $14,000,000. From present appearances it seems that the '95 total will be close on to $16,000,000.

FROM Tucson it is reported that arrangements have at last been made whereby the smelter below the town may be started again. Copper ores are again being purchased. Richard Hamilton is in charge of the smelter. The Silver Bell and San Xavier districts are expected to furnish most of the ore purchased.

THE annual statement of the Parrot Silver & Copper Company, of Montana, shows the amount of the capital stock of the company is $2,300,000, all paid in. The amount of the existing debts on June 1, 1895, is given at $111,591.35. The statement is signed by Franklin Farrel, president, and J. E. Gaylord, A. M. Holter and A. J. Davis, trustees.

COULTERVILLE, Mariposa Co., reports lively times. There are nearly 1000 people there, many doing business in tents by reason of the scarcity of houses. The Merced Mining and Milling Company is working 175 men, the Pyxo 45, the May Harrison 35, the Red Banks 50. Many substantial improvements are projected and considerable new machinery is going in there.

THE English company, who recently secured control of the nickel mines at Lovelocks, Nev., have about completed their $75,000 plant and intend beginning operations next week. Reports say the ore goes from ten to forty per cent nickel, which is unusually high. It is understood that if the smelting tests are successful that Chas. T. and W. S. Bell, who have worked it for fourteen years, will be paid $200,000.

DURING June the Alaska Treadwell mine crushed 22,823 tons of ore and treated 384 tons sulphurets. The ore averaged $3.57 per ton. A shipment of $81,432 arrived this week. A $75,000 dividend will be paid next Monday. During June, the Alaska Mexican mine crushed 6614 tons averaging $2.65 per ton; 134 tons of sulphurets were treated. The expenses of the month were $10,500. A 15c per share dividend will be declared next week.

A HALF interest in the San Fernando copper mine, San Diego county, has been sold to Gen. E. C. Humphreys, acting as representative of capitalists of Colorado Springs and the Woods Investment Company of Victor, Colo. A stock company has been organized, known as the San Fernando Mining and Smelting Company, to develop this mine and others controlled by the company. A large quantity of ore is reported in sight, which will be worked at once.

MESSRS. OVIEDO, Salgado and associates are reported to have discovered some very rich gold mines in Lower California about four miles from the west coast of the peninsula, between the 30th and 31st parallels of latitude. The area taken up is very extensive, and as soon as title is complete, operations on an extensive scale will begin. *El Trafico* says Nogales capitalists have been interested, and that an American company will be organized to operate the new properties.

IN reference to the discovery of gold on Anacapa Island, in the Santa Barbara Channel, reported some time ago, M. Buol, mining engineer, who was sent to examine it, reports that there is every evidence of good-paying ore on the island, but recommends further examination, and that mill tests would be better than to rely on assays. Messrs. Pratt and Storke, who made the discovery and location, intend sending out another party to the island to look deeper into the matter.

ONE hears and reads a great deal about hard money, paper money, white money, yellow money, wildcat money, etc., but few communities have all these different varieties in circulation. On the first of July the Emmett, Idaho, *Index* claims to have received white money on subscription, yellow money on an advertising account, a ragged paper bill for change, and towards evening a man came in and planked down a half-grown wildcat, teeth, claws, and all, and demanded a year's subscription. They are all legal tender in Emmett.

THE following is from the New York *Recorder* of the 20th: "The phosphorescent effect of fungi upon the old bark of decaying trees is well known; but it is not so thoroughly understood that there is in California and Nevada a rare tree known as the 'witch tree,' from the way in which every limb, twig and leaf stands outlined in the darkest night by some peculiar phosphorescent quality of the bark. A large tree of this species is estimated to furnish light equivalent to 100 electric lights of standard sixteen-candle power variety, and a few small towns in the foothills have planted witch trees on street corners as an economical means of municipal illumination."

J. A. POLLOCK, of Salt Lake, Utah, says an American reproduction of the Johannesburg cyanide gold fields exists in the Mercur district, where a continuous vein of gold-bearing rock stretches like a blanket immediately beneath the surface of the mountains and following their contour over an area ten miles square. Scientific theory has not yet established the nature of its origin. The ore body consists of decomposed quartz and magnetic iron oxide carrying fine gold, yellow quartz sand and fine silt, with traces of cinnabar, considerable arsenic in places which have escaped oxidizing, but no silver, copper or lead. The hanging and foot walls alternate between hard shale and blue limestone. Evidence is patent everywhere that the region in which the vein lies was once submerged beneath the waters of old Lake Bonneville, the precursor of the present Great Salt Lake.

THREE smelters are talked of in the West Kootenay, B. C., region. One at Nelson, to be erected by the Hall Mining Company for the smelting of the Silver King ore; one on a new site, near Bannock point, at the head of Arrow lake, to be erected by the Kansas City Smelting Co., under the patronage of the C. P. R.; and one at Trail creek by a Montana company, for the smelting of Trail creek ores. This is partly occasioned by the Dominion Government, which is about to give a "bonus" for the establishment of smelters, to be a sum not exceeding $30,000 per annum for five years to be paid for all ore smelted in Canada at a maximum of 50 cents a ton; smelters must be blown in before the first of next July. At present the Pilot Bay smelter is the only one going. Its capacity is 100 tons a day, which would exhaust about half the bonus. If another 100-ton stack is put up, that would absorb the other half of the bonus at its maximum of 50 cents a ton. A large customs smelter of 200 tons a day capacity would reduce the bonus to 25 cents a ton all round at once, making the inducements appear insufficient.

THE tsetse fly, so fatal to draft animals throughout large districts of South Africa, is at last defeated. A railroad is in operation across the fly belt that intervenes between the sea and Mashonaland. When the Masbonaland boom began, some Englishmen thought they would make their fortune by carrying gold-seekers from the coast to the gold fields. They sent a lot of horses and a half-dozen fine new stage coaches to Beira, on the sea, and advertised in the English newspapers that they were ready for business. A party of gold diggers went down the Portuguese coast to take the new short cut to the gold country. Great was their dismay when they learned at Beira that every horse had perished in the fly belt and the stages were stranded there. These vehicles, now mildewed and molderiug, are still seen on the road where they were abandoned—a melancholy illustration of the fact that discretion and knowledge must go hand in hand with enterprise to make it pay. The iron horse gets through. In its triumphant progress it pays no attention to the swarms of the extraordinary insect that never before saw the pack or wagon train it could not destroy.

Metalliferous Deposits in Fissures.

Written for the MINING AND SCIENTIFIC PRESS by MELVILLE ATWOOD.

Lode.—The term lode is exclusively applied to metalliferous deposits which only occupy very *limited portions* of pre-existing fissures, or fractures met with in igneous or sedimentary rocks. By the term "true fissure vein" is meant ore deposits in well-defined fissures, so that in the examiuation of a mine, in the first place, the study of the euclosing rocks and the character and occurrence of the fissure is absolutely necessary.

Arranging rock species according to their structures, it will be found that most rocks fall naturally into one or the other of two great classes: First, Primary or eruptive rocks; second, Secondary or sedimentary rocks. I use the term primary and secondary quite independently of geological chronology.

1st—Primary or eruptive rocks. This class includes rocks which have make their appearance in many, if not all, epochs, from the most ancient to the most recent, from the old granitic outbursts to the eruptions of the now active volcanoes; and if, as is now generally admitted, the earth be regarded as having once been a molten sphere, the consolidated original crust of the globe would pertain to this class of rocks.

The 2d class—Rocks pertaiuing to this class are all directly or indirectly formed from the breakiug up or debris of previously existing rocks. When found in the normal state of sedimentary deposition, they may he conveniently subdivided into:

1st—Rocks formed of the immediate products of the hreaking up of eruptive rocks.

2d—Rocks built up of the more or less rounded or angular debris of previously existing sedimentary rocks.

3d—Rocks composed of mineral substances extracted from aqueous solution by crystallization, precipitation or the action of organic life.

A large portion of fissures, or cracks in the earth's surface, are formed by intrusive igneous rocks, termed "dykes," which have penetrated both *igneous* and sedimeutary rocks *long after they were in place*, and the spaces between intrusive rocks and those in place form the fissures.

These dykes vary very much in thickness, both in a vertical and in a horizontal direction, and they frequently die out before reaching the surface, so that absence of continuity in the outcrop is no proof of a want of continuity underground.

Another class of fissures or cracks are caused hy the disturbance of the equilibrium to which the crust of the globe has been periodically subject. Also to different points of a giveu area having been acted on by unequal or subsident forces, generally accompanied by alterations of level, the effect of which is that points on the two sides of the fissure which coincided before are no louger opposite to one another, so that in stratified rocks the amount of displacement is easily seen and measured.

In the examination of a gold mine, it is of the greatest importance to find out what is the average width and hreadth of the different chimneys and pay shoots, also the course aud angle of dip of the pay shoot from the horizontal.

The length of the auriferous pay shoots in different fissures on the line of strike or course of the fissure varies from fifty to some hundreds of feet. The auriferous shoots or quartz matter, after consolidation, contract, and even in the narrowest quartz shoot there is evidence of their shrinkage, allowing the running down of rain water from the surface; and though those portions of the fissure not occupied by quartz may to some extent dam up the water, yet the pay shoot will be the channel hy which it will find its way to all the lower workings.

A great deal has been written respectiug the filling of auriferous matter iu the shoots, chimneys, etc., which occur or occupy such limited portions of different fissures; but in case a careful examination is made of the condition of the gold and gangues, the fact of their having been precipitated from aqueous solution will be too apparent to admit of contradiction.

The Mineralization of Gold.—The telluride of gold is the only ore of gold that so far has been met with in any quantity, and then it is mostly found in what are termed "pockets." But should it he so disseminated in the lode matter as not to admit of assorting, the plan I used at the San Jose mine, Minas Geraes, Brazil, can be successfully adopted, namely, to roast the lode matter in heaps, with cord wood so arranged as not to overheat or slag it, and then pass the roasted matter through the stamps.

The two principal gangues of gold are quartz and pyritic matter. The gold sometimes is found crystallized in crystals of the quartz, and beautiful crystals are frequently to he seen deposited on the faces of the pyritic crystals. I have a specimen of placer scale gold, water worn, in which the scales are imbedded in pyritic matter.

Some Concluding Considerations.—The terms "vein" and "ledge" without addition or qualification have a very broad signification. For instance, veins of granite, non-metalliferous rocks or fissures filled with silicious matter, cale-spar or other minerals, are called veins or ledges. Lava dykes are also termed veins. The term "auriferous slates" is very misleading, and is only used by those who have no practical knowledge of gold mining. Slates are sedimentary rocks.

In the *Scientific Apparatus and Literature* for Dec. 15, 1893, is an article "On Electric Phenomena," wherein is the following: "Professor John Trowbridge, in the course of an extensive series of experiments carried out between Cambridge and Boston, U. S. A., found that the earth was full of electric currents, and that at no point explored was evidence of earth currents absent. They were, however, most pronounced along water courses.

"Many years ago R. W. Fox, F. R. S., wrote: 'If electricity be evolved when several differeut mineral substances are brought into contact, and likewise in the process of crystallization, etc., may it not in connection with the strata and veius, and the almost distinct portion of water which abounds in the earth, also act its part on a larger scale, and not only excite heat, but contribute to produce the extraordinary aggregation and position of homogeneous minerals in veins, etc., and the beautiful order which exists even under the surface of the earth?'

"Mr. Fox's theory, which certainly seems to be borne out by his observations, was that these crevices were very deep and contained more or less saline water, which, owing to differences of temperature in the earth's crust, was kept continually circulating, thus inducing and intensifying chemico-electro-magnetic actiou in *rocks*, attracting the minerals which were deposited in the crevices."

There is much to be said in favor of this subterranean electric force as an agent in various phases of metamorphism.

By long and careful experimentation, Mr. Fox found that the potential of rocks below the surface varied in a high degree, some being negative and others positive. He moreover discovered that there were decided electric curreuts in the mineral veins themselves. By placing a wire in contact with an ore point in the vein and the adjacent rock, and counecting it with a prepared bath at a considerable distance, these subterranean currents were sufficient to produce an electrotype copper plate. Professor R. Hunt states in a paper ou "The Electricity of Mineral Veins," in the tenth report of the Cornwall Polytechnic Society, that he succeeded by means of these electric currents in mineral veins to magnetize a horseshoe. But the great interest of Mr. Fox's work was the proving that the curious arrangement of crystals iu some ores, the transformation of metals and their separation, is due to magueto-electrical earth currents.

The Mother Lode.—This term, without addition, would signify a contiuuous fissure for a distance of nearly 100 miles, and filled with metalliferous deposits. The fact is, however, that there are a number of parallel intrusive igneous dykes, some of them a considerable distance apart and partaking of what are called and described as composite dykes by Prof. J. W. Judd, Esq., F. R. S. (Professor of Geology in the Royal College of Science, London) in his able and highly instructive paper read before the London Geological Society, June 21, 1893:

"1st. Definition and Classification of Composite Dykes."

"Those dykes which are filled with materials differing one from another in chemical composition or mineralogical constitution may be conveniently spoken of as 'composite dykes.' In some cases the diverse rocks found in the same dyke may be only varieties of a single type, exhibiting dissimilarities in the proportious of arrangement of their several mineral constituents, hut in other cases two or more rock species absolutely distinct may he found to enter into the constitution of a single dyke. A careful study of these composite dykes shows that they fall naturally into two classes, as follows:

"A. Composite dykes in which a differentiation has gone on in the material that has filled the dyke.

"This differentiation usually results in the separation, or partial separation, of the vitreous base of the rock from the crystallizing process, acting selectively within the dyke, and has led to the formation of rocks which, in different parts of the dyke, show marked variations in chemical composition or texture and even in mineralogical constitution. The separation of the glassy from the crystalline materials in this variety of composite dykes takes place in various ways. The vitreous material may form lateral bands (selvages) or irregular patches, or it may fill 'amygdaloidal cavities.' But in all cases there is found to be more or less perfect gradation from the one type of rock to the other.

"B. Composite dykes in which there has been injection of different materials into the same fissure.

"In these the later injected rock, though it may contain minerals and fragments derived from the older injection, exhibits no trace of gradation into it, hut can always be recognized as another type of material distinct in chemical composition or mineralogical constitution. In such cases we may infer that differentiation must have taken place in the magma deep dowu in the earth's crust and far below the fissure which is now filled with the two products resulting from the differentiation. While, however, it is probable that such composite dykes are usually filled with materials coming from the same subterranean reservoir, it is possihle that, in certain exceptional cases, a dyke may he reopened in such a way as to allow of molten material from a source totally differeut from that which supplied the earlier injectiou fiuding its way into the fissure. In such exceptional cases the composite character of the dyke must he regarded as an accident.

"In many instances the younger injection is found occupying the center of the dyke, for, owing to the cooling of the mass from the sides, a plane of weakness (often very manifest in columar dykes) may origiuate along the middle of the dyke. In this plane, indeed, contractions due to crystallization not infrequeutly leads to the formation of numerous cavities. But there are other instances where the junctious between the dykes and the enclosing rock constitute planes of weakness, along which the later ejected material has forced its way. In such cases the rock occupies the center of the dyke."

The reason why I have quoted so largely from the papers by Prof. Judd and others on intrusive igneous dykes is that I consider the study of them of such great importance to the miner.

The results of my examination of specimens taken 100 feet east of the Keystone main shaft are as follows: A hasic igneous rock, dark greenish color, specific gravity 2.800, contained silica about 45 per cent. Under the microscope the following minerals were found: Oligoclase, albite, anorthite, chlorite, pyreue (angite), labradorite, and as accessories magnetite and pyrite.

These intrusive dykes causing fissures called the "mother lode" are igneous rocks ejected in a melted state from a deep-seated source of fire through spaces made by the fracturing and raising of the beds of slate and other sedimeutary rocks from their horizontal position, the sedimentary rocks having been a very long time in place before the intrusion, the slate at the time having what is termed the cleavage structure. (In many instances writers have confounded cleavage with stratification.)

In proof of the condition of the dykes at the time of their intrusion, Prof. John Phillips, F. R. S., in his treatise on geology, remarks, when describing the dykes in Newcastle and Durham: "In working the coal toward the Cockfield dyke, when within fifty yards of the dyke the coal begins to change. It first loses the white spar in its joints and faces—loses its quality for producing flame. Nearer the dyke it has the appearance of half-burnt cinder. Eight yards from the point at which the coal becomes a real cinder—that is, eight yards nearer the dyke—the coal assumes the appearance of soot caked together."

The different fissures on the rauge of what is called the "mother lode," and limited portions of which are filled with auriferous deposits, are not all of them the cracks or spaces between the dykes and sedimeutary rocks, which dykes sometimes form what is termed the hanging, and in others the footwalls of the fissure. but fractures in the sedimentary formations parallel to them but at a considerable distance, and the result, no doubt, of the upheaval aud fracture by the intrusive rocks, small fragments of which are met with in many of them, and without question they have derived their minerals and auriferous contents from the same deep source.

I have been engaged for very many years in the working of gold, silver, copper, zinc and other mines, and the results of my investigations during that time, and from reliable information obtained from some of the best authorities, I have come to the conclusion that the different fissures, in portions of which are metalliferous deposits (that these fissures) have been the outlet of metallic and mineral vapors from deep-seated sources, which, in their passage upward, accumulated from the different formations a large proportion of their contents, and on nearing the surface were condensed aud took a liquid form. They were also then mixed with metals and minerals already in solution and derived from rocks still nearer the surface. A large proportion of the metals and minerals in the combined solution were then precipitated on congenial rocks or minerals by electro magnetic currents, which are known to be so strong in all fissures, particularly when there is considerable moisture.

We know that lodes are richer near the coutact of plutonic and stratified formations, especially where the former sends dykes into the latter.

In auriferous deposits the shoots and pipes, or chimneys, appear to have been the channels by which the metals and minerals were brought to the surface and which may account for the large bodies of quartz occasionally met with on the surface.

The question is often asked, do auriferous deposits decrease in richness as depth is attained? It all depends on the situation of the mine and the character of the enclosing rocks. The richest and most productive part of the Comstock fissures, so far, has been that above the level of the Sutro tunnel, though, curiously enough, in my collection I have specimens of ore taken from the outcroppings of the Ophir mine, and from the 1650-foot level of the Consolidated Virginia mine, which are so much alike

that they appear to have been broken from the same piece of ore.

The gold mining business in California has seldom looked brighter than at the present time; old abandoned mines being now opened out and worked with success; water, improved methods of extracting and milling the rocks, cheaper labor and reduced cost of supplies enabling the miner to work rock to a profit for what it cost him to mill it in the early days.

I feel confident that if the same amount of capital that is now being spent in the African gold mines was *judiciously invested* in our California gold mines, that the results would be so satisfactory as to again attract miners from all parts of the world.

An instance of the results of judicious investment of capital in California was the Eureka mine. The enterprising Jules Fricot purchased it, and in 1864 sunk a perpendicular shaft to the depth of upwards of 100 feet, which intersected the *pay shoot* at that depth. He then built a quartz mill, and erected hoisting and pumping machinery. He afterwards disposed of part of the property to a San Francisco company, who took out $5,700,000 from the claim, a large proportion of which was paid in dividends.

The Idaho and Maryland claims are a continuation of the Eureka pay shoot, and in the same fissure. The Coleman Bros., to whom Grass Valley is so greatly indebted, first bought the abandoned "North Star" mine, made a success of it and then sold it for a large sum of money. They then commenced work on the Idaho, which by good management has proved so far to be the richest mine in California, yielding in the neighborhood of $12,000,000, and it is said nearly one-half of that has been paid in dividends.

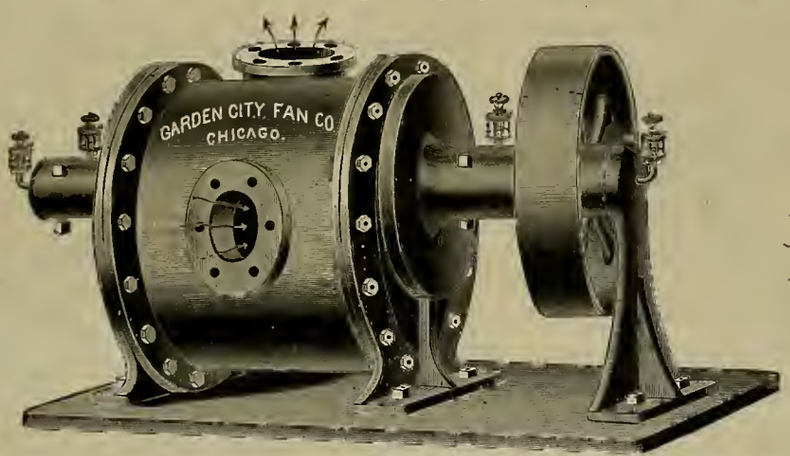
No mining capitalist on this coast has developed richer gold mines than Alvinza Hayward, Esq., and his operations have not been confined to a few localities. With good judgment and practical knowledge, he has opened out old abandoned mines, and with the aid of improved machinery made them good paying concerns, for instance the Utica mine, the output of which for a considerable time has been greater than the richest of the African gold mines.

Up to the present time the total length of all the cables laid is said to be about 157,713 nautical miles. Most of these cables have only one core, but some have two or more. The total length of core in the above-mentioned length of cables is about 166,900 nautical miles. Of this length 165,000 is insulated with gutta-percha and 1900 with India rubber. The approximate weight of gutta-percha used in the above insulation is 23,000 tons for the 166,900 miles. The approximate weight of India rubber is about 152 tons. Besides the above-mentioned submarine cables there must be some 100,000 nautical miles of cables laid by various governments and States for military defense. The longest stretch of cables are, of course, those running across the Atlantic to North and South America, and the shortest across the English and Irish channels, and between Java and Sumatra and Athens and Corinth.

A New Positive-Pressure Blower.

Herewith is illustrated a positive-pressure blower, a radical change from anything heretofore made, and novel in its construction. A difficulty experienced with most positive blowers is in the gearing. The life of the ordinary gear is comparatively short, and when it finally succumbs it rarely gives warning. There is a demand for something that will do the work without the use of gears or intermeshing revolvers, or internal parts that depend upon the gears to preserve proper contact or alignment, which is absolutely a requisite to obtain results. The sectional cut of this blower shows that there is an entire absence of any gear. It is as simple internally as the ordinary fan blower, but does not depend upon a high velocity to obtain pressure, being positive at any speed. All the air that enters inlet is effectually pocketed and forced forward, with no opportunity for backward escape, until finally delivered at the outlet; if the outlet is closed the blower will stop.

The blower has been placed upon the market after numerous experiments. Another important feature that will commend itself is the fact that this blower is practically noiseless, and requires less power than other similar machines. It is made by the Garden City Fan Co., Chicago, Ill.



A NEW POSITIVE-PRESSURE BLOWER.

Dry Placer Machines.

It is a great trick to handle a dry pan well—wet washing is nothing to it—and the Mexicans down in these Arizona diggings manage it with the swiftness and skill of a prestidigitator, says "Fitz-Mac" of Prescott, Arizona, in the Denver *News*. You can scarcely follow them with the eye to learn the knack of it, so rapid are the movements—tossing, twirling, deftly shaking with little jerks that send the gold toward the bottom and leave the coarser sand and gravel at the top to be pitched off with a magical flip, a turn of the wrist done in a twinkle of an eye, which, repeated and repeated so rapidly that your gaze is confused by the motions, soon eliminates all but a spoonful or two of the heavier iron sands. This is now kept in the air by skillful tossing while he blows upon it with his breath to drive off the fine dust and any large particles of light sand, adjusting the draught with scientific accuracy to the relative weight of the gold and the iron sands that always, more or less, accompany it in either dry or wet panning.

It is now ready for the quicksilver, and with another flip he tosses it into a can containing more of the same, to be amalgamated at his leisure when he has a lot of it. But if he chances to be out of quicksilver, he can blow it with his breath almost down to pure gold by taking a little more time and care, so perfect is his skill and so accurately trained his eye to measure the weight of the particles of gold he is handling and bring just the right draught to bear upon them. This is only in panning; but, as a matter of fact, the pan is very little used in dry placering, except as it is used in wet placering, to prospect and to fine down the product of whatever simple machine may be employed.

The little machine employed in dry placering, and which takes the place of the old rocker of wet regions, is a small affair—so light that a miner can toss it on his shoulder and carry it from one position to another. It is built very much in shape and employs exactly the same mechanical principles—a series of graded screens and a fan blast—as the fanning mill used on farms to clean grain, except only that the last screen is a piece of muslin with wires stretched across it to aid in retaining the gold. The draught is forced through this cloth and must be regulated according to the conditions of the dirt and the gold.

For the benefit of readers who are not miners, I may mention that the success of the operation depends on the fact that gold is from two to five times as heavy as most of the accompanying dirt, so that a draught strong enough to blow the dirt away will leave the gold upon the cloth with a small quantity of the heavy iron sands, from which it has to be separated by quicksilver. The gold being heavier than quicksilver—about as 19 to 13—readily sinks in it and forms an amalgam. The iron sands, being lighter, float upon the quicksilver and are easily blown or brushed off. Quicksilver volatilizes at a very low heat and is thus driven off as a gas in a retort and precipitated for repeated use, so that it is not very expensive nor very troublesome.

To work one of these little dry washers to advantage requires two men, just as it does to work the old wet rocker—one to shovel the dirt into the hopper and the other to turn the fanning wheel by a crank with one hand and keep the screens from clogging with the other.

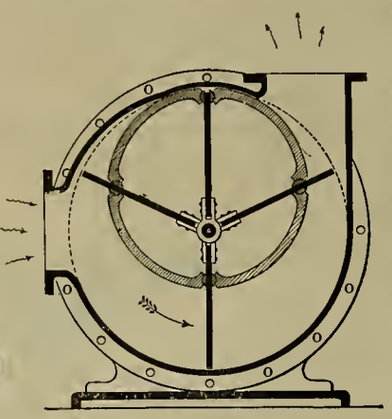
There are innumerable patented dry washers, but the little machine I have described employs none but old and well-known mechanical principles and I presume cannot be patented. At least, I know the miners down here make most of those used themselves. A man handy with carpenter's tools, and having a pattern at hand, ought to be able to make one in a day at an expense of $5 for materials.

They are very efficient little contrivances and one would think they might be easily improved to work on a large scale, but so far as I am aware all attempts to do dry placering on a large scale by machinery have not proved successful in general practice. The trouble probably is that, being heavy and cumbersome, they cannot be easily, quickly and cheaply moved about and adjusted to meet the ever varying conditions of the placer field.

Placering by the dry method can only be successful in an arid region, where the ground is as dry as flour. The least dampness interferes; therefore, one can see the method is not of very extended use. But it is used all over Arizona more or less, and in the State of Sonora, Mexico, which lies directly south and is similarly conditioned, being even much more arid, hotter and very rich in placer grounds, which are now worked extensively by the dry method.

I should say as a likely guess, though I have no statistics to back it, that nearly as much gold has been recovered by the dry method as has ever been recovered in Colorado by the wet. But Colorado has always possessed the knack of making a noise in the world. Just about the time the country was wild over the placer grounds of Gregory and Russell gulches and Spanish Box up Clear creek, Arizona was producing by dry washing in the La Paz diggings on the Colorado river more gold than Gilpin county. Yet the fame of Gilpin county filled the country, and outside of La Paz one scarcely heard of La Paz, though if tradition may be trusted 500 or 600 miners were placering there and turning in $100,000 a month—about $200 a month to the man—so it is evident they made wages. They were Mexicans mostly. The inhabitants of that district still are mostly Mexicans, and several scores, if not a couple of hundred of them, still remain about the old diggings and make a living by dry washing.

The turning back of the waters of the Red sea by a strong wind, as told in Exodus, was repeated this last spring in presence of Mayor Tullock, who has reported the facts to the British Government. A wind arose so violent that it drove all the waters back, leaving the sailing vessels stranded on the saudy bed of the sea. This is the Bible description, and the time of year when it occurred was the same as when the Israelites made their exodus from Egypt 3500 years ago.



Of the 11,621,530 square miles that Africa comprises, England now holds 2,194,880. France has 3,326,790 square miles, including Algeria, Tunis, and a large part of the Sahara; Germany, 884,810, the greater part acquired since 1884; Portugal, which at one time had almost a monopoly of Africa, now owns only 826,730 square miles; Spain holds 153,834, chiefly on the Sahara coast, and Italy 548,880. The Congo Free State contains 905,090 square miles, and the Boer Republic 177,750. Europe has already seized upon more than three-fourths of the continent.

How We Go to Sleep.

"Order is Heaven's first law," and the truth is manifested even in the process of going to sleep. When a man drops off to sleep, says the Cincinnati *Medical Journal*, his body does not do so all at once, so to speak. Some senses become dormant before others, and always in the same order. As he becomes drowsy the eyes close and the sense of seeing is at rest. It is quickly followed by the disappearance of the sense of taste. He next loses the sense of smell, and then, after a short interval, the tympanum becomes insensible to sound, or rather, the nerves which run to the brain from it fail to arouse any sense of hearing. The last seuse to leave is that of touch, and in some hypersensitive people it is hardly ever dormant. Even in their case, however, there is no discriminating power or seuse of what touched them. This sense is also the first to return upon awakening. Then hearing follows suit, after that taste, and then the eye becomes able to flash impressions back to the brain. The sense of smell, oddly enough, though it is by no means the first to go, is the last to come back. The same gradual loss of power is observed in the muscles and sinews as well as in the senses. Slumber begins at the feet and slowly spreads up the limbs and trunk until it reaches the brain, when unconsciousness is complete and the whole body is at rest. This is why sleep is impossible when the feet are cold.

The MacArthur-Forrest Patent Commission.

The commission sent by the South African courts to gather testimony evidence in the case of the MacArthur-Forrest patent for the extraction of gold by cyanide, got as far west as Salt Lake, Utah, and then returned to New York.

The commissioner-in-chief is E. Kent. With him is T. W. Goad of Denver, manager of the Gold & Silver Extraction Company of America; W. D. Edwards of New York City, of counsel for the patentees; J. N. Sparks of London, a MacArthur-Forrest engineer; C. W. Truslow and Dr. H. Wurtz of New York, representing the South African contestants.

The commission is at the instance and expense of the owners of the MacArthur-Forrest patents; its object is to present to the courts of South Africa the testimony of practical American mining men and mining engineers regarding the MacArthur-Forrest cyanide patents, and the general applicability of their process to American low-grade, gold-bearing ores. This commission began its sittings in New York, adjourned to Denver, then to Salt Lake, and then back to New York.

The litigation over these patents involves the expenditure of hundreds of thousands of dollars. The cost is probably greater than that in litigation over the Bell telephone inventions. The English High Court of Appeals, composed of three judges, has decided unanimously in favor of the patent for the dilute solution of cyanide, reversing the judgment of the court below. There is, however, still pending the suit referred to in the South African courts, and also a suit against the Mercur Mining & Milling Company of Salt Lake.

The process has been used in a modified form in working the gold ores in Mercur district, and the owners of some of the claims in that district contested the right of the company to exact a royalty for the use of the process, generally known as the MacArthur process. It was this suit which was recently heard before Judge Merritt, the case of the Gold & Silver Extracting Company of America vs. the Mercur Gold & Silver Mining Company. Judge Merritt sustained the demurrer to the complaint, and gave leave to file an amended complaint.

The first witness was E. C. Steen. The commission had traveled 3000 miles to hear his story of the cyanides of potassium as he had applied it to the extraction of gold while conducting the Union mine in Amador county. For forty-five years the witness had resided in this state. He had come here in 1850, and had ever since been directly or indirectly, he testified, connected with mining and the manufacture of mining machinery. In 1864, he purchased the Union mine, and, having operated it for some four or five years, turned it over to John J. Haley and his associates. The mine was subsequently relocated by Eli Gardner, who had been in witness's employ in former years, put in condition for sale and disposed of to prominent brewers in California. The gold was very fine, and it was impossible to save it through any of the processes then known. Amalgamation was the process applied to it. They occasionally used cyanide of potassium, but that was to purify and enliven the action of the "quick" and scour the plates. They put in a piece occasionally about the size of a hickory nut, but it did not appear to do much good, said witness, and it was abandoned. Witness had no knowledge that it was a solvent of gold at that time. Had he been aware of it he would not have used it, as he sees now that the gold they sought to save was dissolved and carried off down the creek.

"To what extent were you successful in the handling of this mine?" was asked by counsel of Mr. Steen.

"To the extent," said he reproachfully, "of losing $110,000."

Until some five years ago witness had never heard of the cyanide process for the extraction of gold, when he learned of the MacArthur-Forrest process.

J. E. Galligher was the next witness. He testified that he was well acquainted with the systems of extractiug gold and silver with the MacArthur-Forrest process in a general way. He had never had any practical experience in its application, but understood that the essential part of the process was the application of a weak solution of cyanide. He was not familiar enough with the process to say whether or not it was customary to pulverize the ore, but understood that it was being successfully done in the Mercur district. Mr. Galligher further testified that he had never heard of the use of cyanide in extracting gold from ores prior to the introduction of the MacArthur-Forrest process.

On cross-examination Mr. Galligher testified that he did not know whether or not alkali was used in the MacArthur-Forrest process, and did not know of his own knowledge what was the strength of the solution. He had only heard of it from others. Mr. Galligher testified that he was not an owner or stockholder in any of the MacArthur-Forrest companies, and was in no way connected with the patents or any of the owners.

The collection of evideuce since the present attack upon the patent was opened by James Hay has led to most voluminous results, the evidence for plaintiff alone filling a printed volume of 974 pages, while the cost of the issue to date is over $350,000, with expenditures continuing to pile up.

Mr. Sparks, one of the engineers for the MacArthur-Forrest Company, says that in May the South African gold mines had produced 74,000 ounces of gold through that medium alone; that it was successfully handling ores of a gross value of $1 per tou, aud that it was now in use in New Zealand and Australia in addition to America.

Mr. Thomas Goad, manager of the American Company, a licensee of the MacArthur-Forrest people, states that the Moffat mill alone at Florence was producing $10,000 a week, with a capacity of 100 tons daily, which was being increased to 500 tons, and that from all parts of the country came inquiries concerning the process and its applicability to ores accompanying the inquiries.

The defense of the Mercur management will be that it has in no wise been guilty of an infringement, in that the representatives of that process were unable to successfully apply it to the extraction of Mercur ores.

Value of a Ton of Ore.

How to Find the Gold and Silver Value of a Ton of Ore from Its Assay Button in Grain Weights.

TO THE EDITOR:—Fine scales with Grain weights to the one one-hundredth part of a grain, also to the tenth of one one-hundredth of a grain, are all that is requisite for the practical miner.

For this system of valuation, one ounce avoirdupois is used for the Assay Ton, although one-half ounce or any number of avoirdupois ounces can be used as hereinafter mentioned.

All ore must be in Avoirdupois, viz., 437½ grains to the ounce, 16 ounces to the pound, 32,000 ounces to the ton of 2000 pounds.

Gold and silver always to be weighed in Troy—12 ounces to the pound, 480 grains to the ounce.

One Grain is the unit of both weights.

Gold is $20.671824 per ounce and $0.0430663 per grain. One grain gold button from an assay ton of ore, 437½ grains, one ounce avoirdupois, is $1.378.12 for the ton of ore, 32,000 ounces and 32,000 grains of gold. One one-hundredth of one grain gold buttou from same assay ton is 13.78\frac{12}{100}$ for the ton. One-teuth of one one-hundredth of one grain gold button from same assay is 1.37\frac{812}{1000}$ for the ton.

To prepare to find the value in a ton proceed as follows:

After making the assay, weigh the button of gold and silver and make note of the total weight; place button in, say a half-inch test tube, and pour in about one-fourth inch deep pure nitric acid. Carefully wave it over a lighted alcohol lamp until the silver is dissolved; fill with water and pour off the liquid into salt water to save the silver some other time; dry and weigh the pure gold button into one-hundredths or tenths of one-hundredths grains; also make note of the weight of silver dissolved, so as to estimate its ton value, same as for the gold.

To prove the gold value of a ton of ore by its assayed gold button from 437½ grains of the ore, one ounce avoirdupois, take the value of 32,000 grains of gold, *i. e.*, one grain to each ounce of ore in a ton, viz., $1.378.12; multiply this amount by the one-hundredths grain weight of the button, and you have the exact value of the tou of ore; point off *two* figures of the answer on the right hand as fractions and the other figures as Dollars and Cents. If the weight of gold button is below one one-hundredth of a grain, multiply in same manner, but point off *three* figures on the right, and the others into Dollars and Cents. Thus:

$1,378.12
$\frac{10}{100}$ gr. button.
137.81\frac{20}{100}$ value ton ore.

$1,378.12
$\frac{150}{100}$ gr. button.
6890600
137812
$2,067.18$\frac{00}{100}$ value ton ore.

$1,378.12
$\frac{1}{10}$ of $\frac{1}{100}$ gr. button.
1.37\frac{812}{1000}$

$1,378.12
$\frac{9}{10}$ of $\frac{1}{100}$ gr. button.
12.40\frac{308}{1000}$

Calculate weight of silver dissolved in same manner at its market price—say at 67 cents an ounce; use $44.66 as the multiplicand; at 68 cents an ounce, use $45.33, and so on, adding or deducting 67 cents to this multiplicand for each one cent rise or fall of the market price. At 69 cents an ounce use $46.00, which is the value of a ton of ore with one grain of silver to each ounce of ore in ton—32,000 ounces; or 60 cents to the ton with one one-hundredth grain to the ounce, or 4$\frac{60}{100}$ cents to the ton for one-tenth of one one-hundredth grain.

If one-half an ounce of ore is preferred, 218¾ grains for the assay ton, then multiply the dollars and cents results by two, or if more than one ounce is assayed, then divide dollars and cents result by the number of ounces treated.

ESTIMATES FOR READY REFERENCE.

$\frac{1}{10}$ of $\frac{1}{100}$ of a grain...	1.37\frac{812}{1000}$ value ton of ore.
$\frac{2}{10}$ " " " " ...	2.75$\frac{624}{1000}$ " " "
$\frac{3}{10}$ " " " " ...	4.13$\frac{436}{1000}$ " " "
$\frac{4}{10}$ " " " " ...	5.51$\frac{248}{1000}$ " " "
$\frac{5}{10}$ " " " " ...	6.89$\frac{060}{1000}$ " " "
$\frac{6}{10}$ " " " " ...	8.26$\frac{872}{1000}$ " " "
$\frac{7}{10}$ " " " " ...	9.64$\frac{684}{1000}$ " " "
$\frac{8}{10}$ " " " " ...	11.02$\frac{496}{1000}$ " " "
$\frac{9}{10}$ " " " " ...	12.40$\frac{308}{1000}$ " " "
$\frac{10}{10}$ " " " of 1 grain or $\frac{1}{100}$ of 1 grain.....	13.78$\frac{12}{100}$ " " "
$\frac{10}{100}$ of 1 grain.....	137.81$\frac{20}{100}$ " " "
$\frac{50}{100}$ (½ of a grain)	689.06 " " "
$\frac{100}{100}$ (1 grain).....	1,378.12 " " "
$\frac{500}{100}$ (5 grains).....	6,890.60 " " "

1 grain Troy.....$	0.04.30663
1 oz., 480 grs.....	20.67.18240
1 lb., 12 ozs.....	248.06.18880
1 ton, 24,000 ozs., 2000 lbs.....	496,123.77.60000

1 grain Avoirdupois.....$	0.04.30663
1 oz., 437½ grs.....	18.84.15062
1 lb., 16 ozs.....	301.46.40992
1 ton, 32,000 ozs., 2000 lbs.....	602,928.19.84000

U. S. standard gold coin, 900 fine.

A. H. JOCELYN,
N. Y. "Daily Financial News."

Value of a Technical Education.

Fifty years ago the young man who, entering a life of activity, had "a good common school education" was fortunate. In those days the college was for the lawyer, the doctor, the minister. Then the young man could "learn a trade." To-day there are few trades to learn. The carpenter of to day is not the carpenter of fifty years ago, nor is the cabinet maker, nor the blacksmith, nor the shoemaker. Times have changed—wonderfully, radically changed. The little shops have almost passed out of existence, their usefuluess and necessity having been destroyed by the advent of the mammoth factories with equipments of ingenious mechanisms for producing the wares which hand labor so tediously and proudly turned out. The steam-actuated hammer has taken the place of that swung by the sturdy arm of the blacksmith, and the creaking bellows has given place to the little and more powerful fan. In every line of productive industry equally radical changes in methods and mechanisms have taken place. Production has increased, and labor has found a greater field for its exercise. The conditions under which the young man of to-day assumes the task of building his fortune demand a broader education and a different character of ability from those necessary when his father began his life-work.

To-day no one questions the high value of collegiate training, but is it an essential of business success in the productive arts? Must the young man without means to establish himself in business complete a college course before entering upon his life-work? Decidedly, no. The founding and endowment of polytechnic and technological schools prove this; but does the technological school entirely meet requirements? Again no would seem to be the proper answer, because, while a young man may "work his way through" and graduate with honor, opportunity for all young men, be they ever so ambitious and persevering, is not present. Look over the vast field of productive industrial pursuits to-day, and how many of the profitable, successful mechanisms and inventions can you count to which birth was given by the technically educated brain? Perfection and adaptation of the idea or crude mechanism may have been brought about by the man, or men, educated in the strength, ductility, malleability and durability of materials, who can calculate, almost to exactness, the direction and intensity of working strains; but the crude idea, the embryo, or the imperfect mechanism is, perhaps, more often than otherwise, the child of the uneducated brain. The arts and sciences are moving forward too rapidly, however, to justify waiting for the fruits of uncultured intellect to assist in the onward progress.

In our factories and mills and workshops, to-day, are young men with ambition, with skill and with a desire to advance. They read, perhaps, poorly, spell even more poorly, but in questions of shop practice they're entirely "at home." Talk with them; they have ideas; they cannot put them on paper, at least so as to make them understood, but they'll explain that if this and that could be done, in this or that way, such or such a result would follow. Ordinary early advantages have been, perhaps, per-

force, denied them. Ordinary advantages will not now avail them. How can they now, at a minimum of cost, and without loss of wage-earning time, make up, in special branches, the loss or lack of early education?

Coast Industrial Notes.

—At Grays Harbor, Wash., the sawmills pay $1.75 a day and the logging camps from $30 to $40 per month.

—The Oakland jute mills, employing nearly 500 people, are about to remove to Stockton, if prospective cheap fuel can be secured.

—Judge Ross of Los Angeles has declared the Wright Law invalid, a decision that will greatly retard the irrigation interests of the State.

—The Portland Iron Works, destroyed by fire last April, are being rebuilt. The brick structure is 85x100, first story; the second story 50x100.

What is believed to be the first electric sawmill on the Pacific Coast is being fitted up at Tacoma, Wash. A sixteen H. P. motor will be used.

The Pacific Refining and Roofing Co. is about to build an establishment on its Potrero site, 200x233 feet, to refine coal tar, manufacture building paper, etc.

—The Bicycle Railway Construction Co. has incorporated; capital stock $300,000, all subscribed. Directors—S. H. Bugbee, P. Selby and W. H. H. Hart of this city, E. Dexter of San Diego, and J. L. Wheat of Chicago.

—The Northwestern Lumber Manufacturers' Association have advanced the price of rough lumber to Eastern buyers $7 per thousand feet; first grade flooring to $18; drop siding to $14; bevel siding to $14.50, and finished cedar to $26 to $34.

—California will be well and suitably represented at the Atlanta, Ga., Exposition. A convention of county supervisors this week recommended that $12,500 be paid the State Board of Trade to send its collection of California products, and made preliminary provision for securing that sum.

—The horse meat canning establishment at Linnton, Oregon, the only one of the kind in the country, has began operations. The company buys range horses, packs and ships the meat, and expects to do a good business. A rate of one dollar per hundred on canned horse meat in car loads to the East has been secured.

—The Safe Deposit Building, corner Montgomery and California streets, this city, is being remodeled into a modern office structure. Electric elevators to cost $17,000 are being put in by the Union Iron Works. The Risdon Iron Works is putting in a $6000 engine and boiler. About $150,000 will be spent in reconstructing the building.

—Cargo lumber shipments from western Washington for June show an increase. Reports from nine of the leading mills received by the *Lumberman* aggregate 36,031,081 feet of lumber, exclusive of lath, shingles, pickets, etc. Of this, 19,824,842 feet went foreign and 16,206,239 feet coastwise. Unofficial reports of the shipments of the other mills make the total for the month 41,443,081 feet.

—Major W. H. Heuer has submitted to the chief engineer his report on the improvements of the San Joaquin, Sacramento and Feather rivers. On the San Joaquin river $20,985 has been expended during the year, making the total $341,246 for the improvement. On the Sacramento and Feather rivers the amount expended during the year was $33,426, making the total $611,741. The river is in good navigable condition.

—Several samples of lumber manufactured on the Pacific Coast have been sent to the navy department at Washington, where they will receive attention when the consideration of new gunboats is taken up by the authorities. The samples are furnished by Pacific Coast parties, who propose to put in bids on the building of the gunboats, and who want the authorities to see the kind of lumber that will be used in the vessels.

—The great Parrott building on Market street is magnificent in many details. The contract for building the electric plant has been let for $33,000, exclusive of fixtures and dynamos, covering simply the cost of the wires, insulations and connections for 4000 incandescent and 300 arc lamps. The insulated wires would be almost forty miles in linear length, this being believed to be the most extensive system ever contracted for in any single building in this country.

—The big tunnel of the San Joaquin and Stanislaus Water Company is finished. It is 1200 feet long, and every inch of it is through solid rock. It runs through a stone bluff, around which the company formerly had a hanging flume. Two shifts of men have been working on the tunnel night and day for many months. In some places the rock was so hard that but eight inches were made on a shift, and a blast would break out but a small portion of the rock. Work was carried on from both ends. The machinery and tracks will be taken out this week, and the water from the canal will be turned into it.

—The Vancouver, Klickitat & Yakima railroad has been sold at Vancouver, Wash., to C. N. Scott. By the terms of the sale, the purchasers paid about $5000 cash, and assumed indebtedness amounting to about $34,000. This indebtedness is to be paid in 15-year bonds, drawing 6 per cent; the purchasers also oblige themselves to build at least three miles of extension of the road this year. The sale puts an end to the litigation in the courts. The road is estimated to be worth from $75,000 to $100,000. The proposed extension will tap a valuable timber belt, and the road already has a contract to move 50,000,000 feet of logs.

—The total coal product of the State of Washington in 1894 was 1,106,470 short tons, having a spot value of $2,528,441. Coal mining in Washington received a sudden impetus in 1887 and 1888, practically reaching the limit of profitable production in the latter year, for in only two years since has the product of 1888 been exceeded. The product of 1887 was more than 75 per cent larger than in 1886, and that of 1888 more than 55 per cent larger than in 1887. The product in both 1890 and 1893 exceeded that of 1888 by about 50,000 tons, but these were the years when it did so, though in no year has the product fallen below 1,000,000 tons, since it passed that figure in 1888. In 1894 the product was 158,407 tons less than in 1893, while the value declined $342,435. There was an advance in the average price per ton from $2.31 in 1893 to $2.33 in 1894.

—B. F. Cheney, Jr., of Boston, chairman of the board of directors of the Santa Fe system, accompanied by C. S. Gleed, a director of the company, was here this week on a tour of observation, it is believed, for the purpose of finding out just what is needed in the way of branch lines hereabouts to complete the system. So far over $3,000,000 of railroad construction work is in sight, with almost $10,000,000 to be expended in the near future. The Southern Pacific has construction costing about $2,000,000 in view in the valleys tributary to Los Angeles, while the Santa Fe has undertaken extensions from San Jacinto, Temecula, and other points, which will necessitate an expenditure of about $1,000,000. The proposed Los Angeles and Salt Lake road would distribute $6,000,000, and the proposed San Diego and Phœnix road would cost $4,000,000.

—The next Mechanics Institute Exposition opens at the Pavilion in this city on the 13th prox. It will be different from many of the former ones, more varied and complete, and with special reference to the progress in actual manufacture of coast products. Superintendent Smyth reports that out of an available total of 80,000 square feet of space he already has applications for 76,000. This illustrates the interest felt by manufacturers and exhibitors, and justifies the zeal with which the officers and members of the association are working. Mr. Smyth says it is the wish of the management to consult the preference of exhibitors in the location of their exhibits as far as possible, and they will in all cases concede to an exhibitor the location which he deems the most appropriate to his exhibit, if such location can be made available. The available space portion of the main floor of the building will be occupied by manufacturing processes, which will receive their power from the same line of shafting. It is the present intention of the exhibit committee to occupy the annex hall adjoining the Pavilion with exhibits pertaining to the subject of roads and road making, forming an interesting department. Many of the exhibitors are making elaborate preparations in this department, besides the Merchants' Association, who will have a joint exhibit pertaining to the same subject, comprising individual exhibits by members of that organization. Manufacturing enterprises which have never before been brought to the notice of the public will be there seen in large variety and in actual operation. The fair will be an industrial success, and deserves the cordial co-operation of every one interested in the material progress of the city and State.

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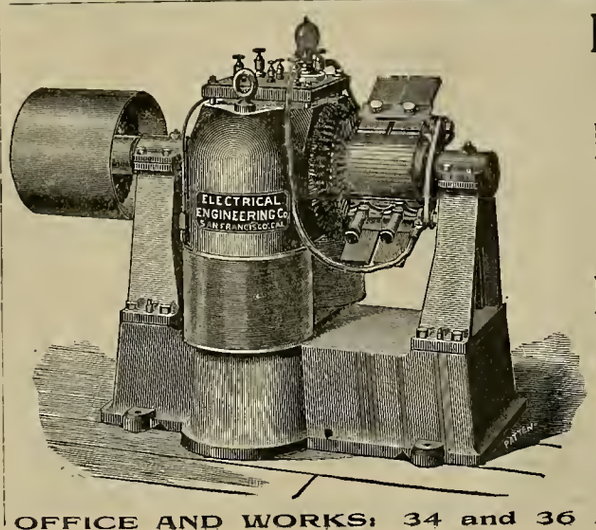
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Mechanical Progress.

The Steam Gauge.

What is a steam gauge? An instrument for indicating the uumber of pounds there are in a steam boiler. But what is a pound of steam? Does it represent pounds in weight, or refer to some system of graduation?

If one weighs out a pound of cold water, and by applying heat, evaporates it into steam, it is simply changed into a pound of steam; but it is a pound tbe same as it was before. Wben we buy meat they take a "spring balance." This is called a spring balance, because if one takes a piece of meat that weighs ten pounds by it, and puts it on one end of say a piece of flat iron which is just evenly balanced over a knife-edged bearing at the center, and then puts ten pounds of iron on the other end, one would just balance the other, provided they were just the same distance from the center bearing. The steam gauge is simply a "spring balance" altbougb the springs in the two instruments are very different in their design and construction.

If one takes a tin box one inch square and a little less than twenty-eigbt inches high and fill it with water it weighs a pound. Lengthen out this box until it is 3722 feet long and apply a spirit lamp to the bottom of it until all the water was turned into steam, the box is full of steam, and still weighs one pound. With more water the height would be greater in proportion, assuming that all of the steam is of the same density. Attach a steam gauge to the bottom of tbe tin box when the water is about twenty-eight incbes bigh, it will indicatc one pound, and whcn it is turned into steam it will indicate the same. The steam gauge and tbe spring balance are the same; but owing to the nature of water, the pressure it exerts is measured by the height, regardless of the size of the column.

Supposing the box is strong enough to withstand pressure, and instead of leaving it opened at the top put in a slide which is tigbt when closed, and locate it at a height of 1938 feet: ucxt putting one pound of water in it, as before, which stands twenty-eight inches high, attach the steam gauge, light the lamp and evaporation begins. When all of the air bas been driven out close the slide and continue to apply heat until all tbe water is evaporated, when the steam gauge pointer will stand at fifteen pounds. We will now empty our box and then put one pound of water in it as before. This time we will locate our slide at a heigbt of 817 feet, and when all of the water is evaporated tbe gauge will indicate sixty pounds. By this we see tbat if the same amount of steam is crowded into a smaller place tbe pressure will be greater.

Let us repeat tbe last experiment, except tbat we will put in two pounds of water instead of one, and when it is all evaporated we sball have a good deal more than sixty pounds pressure. By this we see that if we crowd more steam into a given space, the pressure is increased. This is wbat we do when we get up steam in our boilers, for there is a certain space above the water tbat we have to fill with steam, and the more we crowd into it the greater will be the pressure.

When the pointer moves from any cause, there is some movement of the machinery within, and it naturally follows that the more this is moved the more it will wear; consequently if the gauge is connected to tbe steam pipe of an automatic engine, and every time the valves cut off the steam the pointer vibrates excessively, do not allow it to do so day after day, but close tbe valve in the pipe until tbe pointer barely moves, thus showing that tbe gauge gets the full pressure, and the instrument will last mucb longer.

To fully realize the advantages of steam jacketing in a compound engine, the jacket should be applied to tbe higb pressure and intermediate cylinders and two receivers. It is not advisable in either case, especially where a condenser is used, to apply the jacket to the low-pressure cylinder. The actual gain effected by the use of a steam jacket is "the difference between the saving by the prevention of condensation in the cylinder at the beginning of the stroke, and the loss by heating the exhaust steam during the return stroke." It is necessary to thoroughly consider tbe conditions that an efficient system of steam jacketing offers for tbat purpose, and it may be safely stated that, if properly applied to engines working expansively, a saving of from 5 to 7½ per cent of fuel may be effected. The scarcity of practical, reliable data is probably the cause of a variety of opinions regarding the advantages of the steam jacket. Without doubt it has been practically demonstrated that the steam jacket is a source of economy, and, furthermore, without efficient steam jacketing the highest economy is not attainable. Many engineers wbo are antagonistic to the application of the steam jacket probably pursue that course from having been in contact witb defectively constructed forms, and from wbich the results obtained have been unsatisfactory.

An Interesting Discussion.

The newly elected president of the American Institute of Electrical Engineers, Dr. Louis Duncan, at a recent meeting of that organization, discussed the situation of steam for electricity in railway practice.

Dr. Duncan first considered the proper policy for existing steam roads to adopt. He agrees with other experts in saying that freigbt is now more economically bandled in long, beavy trains than in any other way, and that sucb trains, like infrequent and heavy expresses, can best be handled by steam. When tbe power on a line is being absorbed by a very few (perhaps only one or two) large units, it does not pay at present to use electricity. But wben the "load," or sum of all the demands, is distributed by a great number of smaller units, as when frequent sbort trains are run, electric traction has tbe decided advantage. On four-track roads, then, he would put expresses on two tracks, and continue awhile to run them with steam. The other two tracks he would equip with an overbead wire, provide the local trains witb trolleys and motors, and conduct tbis branch of the service electrically. Tbe freight trains would use tbese tracks, but employ steam. On two-track roads, unless other cbanges are made, Dr. Duncan would not advise the introduction of electricity; but be declares that if sucb lines wish to remain on a dividend-paying basis, "it is imperative" that most of them "either build additional tracks or control the electric roads that parallel them." Many companies to whom tbis advice is tendered already realize, from the experience of the past year, what a formidable competitor tbe trolley has become. It is pointed out by way of illustration that on one single line—the New York Central in 1892—the through passengers numbered 234,650 and the local passengers 21,978,979 (between 93 and 94 times as many). Commutation rates reduce the profit on this class of busiuess, but its dimensions are so considerable as to emphasize the remark just quoted. Dr. Duncan adds: "In a few years electric roads will have absorbed practically all of tbe local traffic and will begin to cut into tbrough transportation. The steam roads cannot afford this. Their only safety is to make of electricity an ally instead of an enemy, and this before it is too late."

Most of the problems that are likely to arise in such transportation, President Duncan thinks, will be disposed of in building and operating tbe proposed line between Baltimore and Wasbington; and he therefore considers that enterprise a significant one. For municipal rapid transit with frequent service, whether on elevated or underground roads, of course the argument is strongly in favor of electricity. A preference for the direct current, instead of the alternating, is expressed in tbis connection; but the objection offered to the latter is not treated as very serious.

The precedent established by the Baltimore and Ohio road in equipping its cross-town line with a heavy motor is pronounced by the new president of the Electrical Engineers a good one, not only for the many other tunnels throughout the country, but also for switching in yards, especially when (as is often the case) the two spheres of usefulness are so close together topographically that the same motor can be used in both.

Scientific Progress.

Exploring the Upper Air.

Meteorologists believe tbat a great deal of useful information may be obtained by an intelligent and systematic exploration of the upper air. The great atmospheric currents which flow from the equator toward the poles, at a considerable altitude, otber movements which have mucb to do witb the progress and route, if not with tbe formation, of our storms, and various conditions of temperature and humidity aloft, on which our weather here below is more or less dependent, can be studied better by a proper series of aeronautic ventures than in any other way. Our mountain observatories possess the advantage of stability, and they permit regular and continuous records of wind direction and velocity and other pbenomena to be made. Valuable contributions to weather science have been made in tbe last few years in consequence of the establishment of such posts. But we want to learn something about regions which are still higber, and which are free from the wind-deflecting and temperature-modifying influences of irregular uplifts of the earth's crust.

Two or three years ago several small gas-bags, not accompauied by living passengers, but equipped with self-recording instruments, were sent up from tbe vicinity of Paris, and one of them, wbich was subsequently recovered, showed that it had attained a height of at least ten miles! The same thing bas beeu done in Germany, too. But it is highly desirable tbat such airsbips, like Cook's tourists, should be "personally accompanied." Observations made under such circumstances are more complete and instructive. When one ascends more than four or five miles, bowever, the air is so rare tbat it is almost impossible to breathe. Glaishes, wbo in 1862 got up at least 29,000 feet (nearly six miles), became unconscious at that point, as did his companion, Coxwell; and this has bcen regarded as about the limit bcyond wbicb one could not hope to go in safety, unless some improvement were made in tbe facilities for sucb work.

Last year tbis record was matched by a German aeronaut, Berson, who took along a cylinder of compressed oxygen, such as druggists in large cities keep for medical purposes, and breathed that gas wben the air had grown too rare for comfort. The lowest reading of bis barometer (9.1 incbes) indicates that his elevation was from 28,700 to 30,000 feet, and his achievements points out a way by which imitators (like Professor Hazen) may reasonably bope to retain full possession of their faculties six, seven or even ten miles up.

Among the results attained on this occasion were these: Dr. Berson recorded a temperature (almost directly over Berlin in summer) of fifty-four below zero, Fahrenheit, something never observed at the surface of the earth except in tbe interior of Nortb America and Asia or the Arctic regions in winter; he found that the rate of temperature decreases with ascent. After be got up a mile it was about one degree to every 250 feet, or more rapid tban bad been bitherto supposed. Below the one-mile limit the rate was slower, while at certain hours in the morning and evening there was a slight increase of temperature with ascent; a good deal of bumidity was discovered in certain strata six miles up; and the cirro-stratus clouds, beretofore believed to be composed, like the pure cirrus, of ice particles, proved to be made up of snowflakes. Eacb single ascent like this, effected by a competent meteorologist, adds perceptibly to our knowledge. But it is desirable that many more, in America as well as in Europe, planned with reference to locality, season and nearness of area of high and low barometric pressure, shall be undertaken in order to enable us to reach safe generalizations on various questions.

First Cunard Steamer.

The first Cunard line steamer, the Britannia, left the Mersey for the United States on July 2, 1840. The company started with four steamers each of 1200 tons gross register, built of wood, and propelled by paddle wheels. Boston was then the great harbor of the States, and the Britannia made ber first voyage in 14 days 8 hours.

Her arrival at Boston was the occasion of great public rejoicing. Salutes of artillery were fired and other festivities werc held to celebrate the important event. A weekly service was maintained for seven years, two more steamers of 1400 tons being built. After this tbe Englisb Govcrnment called on tbe company to double the number of sailings and six new vessels were built. Some little time afterward the paddle steamer Arabia was built. She was a vessel of 2400 tons, and was considered at the time to be the largest it would be safe to build for Atlantic navigation.

In 1852 a radical change was iutroduced, tbe sbips being built of iron, and the paddle wheel being superseded by the screw propeller. This was found to be so satisfactory that only two more paddle steamers were built, and then the screw was adopted in all cases. The immense advance of engineering and shipbuilding since that time is well sbown by the size and speed of the vessels now belonging to the company.

The following is given in brief as the theory most generally entertained by scientists, with a few exceptions, concerning tides: It is assumed that tbe moon, acting alone, would not only raise a wave on the side of the earth nearest to it by gravitation, but would also draw the eartb itself far enough out of its course to leave behind some of the water on tbe farther side, which water would then be raised relatively to the earth's surface, and constitute the second tidal wave. The sun alone would act similarly, altbough its tide-raising effect is only about two-fifths that of the moon. Now, at new moon, the sun and moon "pull together" and give higher tides than at the first and third quarters, when the sun draws its right angles to the line of tbe moon's attraction, and at full moon, when the sun is on tbe opposite side of the earth from the moon, virtually the same effect is observed as at new moon, but the double tide-raising action of the sun would again be superimposed on that of tbe moon and give tides on opposite sides as bigh as those a fortnight before.

Owing to the occasional damage done to the fishermen's nets by what appeared to be fragments of masonry in the sea off the Italian peninsula of Istria, the city authorities of Robingo sent down a diver tbe other day to investigate. At a depth of ninety feet he found himself in a submerged city, with streets and squares laid out, the doors and windows of the half-ruined bouses being almost hidden by masses of seaweed. Archæologists identify this lost city witb the island and city of Cissa, described by Pliny, and of which no trace had been found since tbe days of tbe Cæsars.

Bulletin No. 10 is received from the Department of Geology of the University of California, descriptive of Lawsonite, a new rock-forming material from tbe Tiburon peninsula, Marin Co., Cal., by F. L. Ransome.

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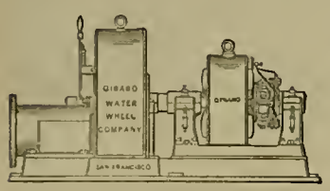
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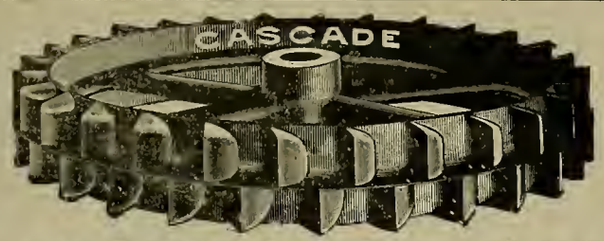


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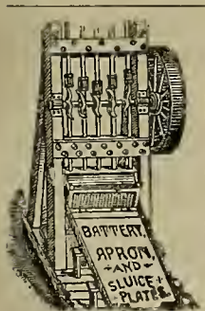


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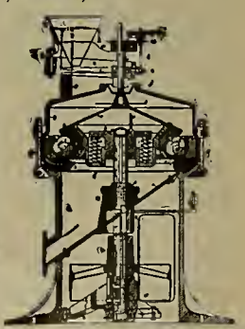
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Mining Summary.

CALIFORNIA.

Butte.

AROUND HAZLETON.—At the Mattie quartz mine the shaft is to be sunk 50 feet deeper. The ledge is 24 inches wide and runs $8 in free gold. The Frederick mine has been bonded by Bothwell & Co., who are developing it. The Phœnix mill is in operation.

THE GOLDEN BUTTERFLY.—Col. McLaugblin is now adopting a new plan in working the Golden Butterfly, and is driving a tunnel 5½ by 6 feet through the bedrock, with the idea of raising into the gravel when beyond the break that has bothered the pipes and kept them playing on top dirt. It is the opinion of many in that locality that valuable gravel underlies Table mountain; this tunnel will confirm or disprove the belief.

THE MAALIA RIDGE.—The Princess Mining Company bave reacbed bedrock, after running an incline over 300 feet.

The Wylie Bros. are running a new tunnel from a lower point. Coates and Miller will flume tbe river from about two miles above.

THE BLUE LEAD BONDED.—The Gridley Mining Company have bonded their mine at Bangor to men from this city, who will work the property this summer.

THE CATSKILL MINE.—The *Register* says the miners who leased the Catskill mine made $3.50 a day on the first clean up and expect to make $5 a day on the next clean up.

Calaveras.

FREE GOLD.—Ore containing free gold is now being taken from the Gottschalk mine. Eleven men are at work.

PURE QUILL MINE.—*Voice:* This mine, is an extension of the Blair mine. The shaft is a vertical one, and is down 75 feet. In crosscutting at the 50 foot level a well developed 1 6-foot ledge of ore was discovered, and the rock which is now being taken out averages $800. The footwall, composed of heavy block slate, is full of mineral.

El Dorado.

RENEWED ACTIVITY. — *Republican:* More gravel mining is being done in the vicinity of Placerville now than for several years past. The Unity Mining Company are breasting and boisting gravel at Dirty Flat which will be washed through a flume as soon as enough accumulates on the dump. Hitberto the gravel has been worked by mill process but Superintendent Kimble finds that the beds now being explored will slack on exposure to the air sufficiently to work by a simple process. On the opposite side of the lava ridge, the Lone Star or Rupeley mine, is breasting gravel, taking it to their mill through a tunnel about twelve hundred feet long. About twenty men are employed. Tbe mill recently purchased from the Unity Company has been erected and is running on gravel from the mine. At tbe Tockey mine, where the new mill was recently erected, work is being vigorously prosecuted through the tunnel hy which the gravel is reached. As soon as the contest over the Potts or Granite mine is settled by the lawsuit now progressing in the Superior Court, it is probable that work will be resumed on tbat property by one or the other of the contestants.

Mariposa.

A GOOD SHOWING.—*Gazette:* We have made a hurried list of tbe number of stamps either now in operation or heing got in readiness for work. While we may have omitted some of the mines, as the mining area is large and we write only from memory, yet the ones mentioned are exact. There are a number of the mines mentioned which are in process of construction, but the wbole number of stamps given will be pounding gold from our unlimited supply of rich ore before the close of the year. The list is given as follows:

Mine and Location.	*No. Stamps.*
Cal. Mines Co., Red Banks	60
Merced G. M. Co., Coulterville	40
Sierra Butte Co., Whitelock mine	40
Hite G. M. Co., Hite's Cove	40
No. 9, Hornitos	30
A. Revel, Sweetwater	10
Santa Rosa, Colorado Dist	10
Buena Vista, Saxon Creek	10
Burt & Bach, Bear Valley	10
Barcroft, Hornitos	10
Tyro, Coulterville	10
Red Cloud, Coulterville	10
Compromise, near Coulterville	10
Bondurant, Coulterville Dist	10
Banderita, Coulterville Dist	10
Golden Virgin, Coulterville Dist	10
Sunset, Snow Creek	10
Eureka, Hornitos	10
Francis, Hornitos	5
Wiswell, Hornitos	5
Ludwig, Mariposa	5
Malone, Bear Creek	5
Branson, Cotton Creek	5
Ellingham, Whitlocks	5
Huntington, Colorado, rotary, equal	5
Breen, Mariposa	2
Perch & Bonham, Plum Bar	2
Total	379

In addition to the above, a chlorination plant has just been completed at the Quartz Mountain mine, near Hornitos, but of what capacity we are not informed.

We credit the Merced Gold Mining company with forty stamps, the number with which the mill will start, but as soon as practicable this number will be increased to 200 or 300.

At the Whitlock mine, also, the mill now nearly completed, is designed for a much larger number of stamps than the forty which will be used at the start.

The No. 9 mine, near Hornitos, is likely to be sold soon to an English company and will be worked to its full capacity.

Every day new enterprises are being started, and it is not improbable that by the beginning of 1896 there will be 500 stamps in operation in this county.

Nevada.

PROGRESSING.—*Transcript:* The building for the new twenty-stamp mill at the Mayflower mine, Canada Hill, is about completed, and the foundation for the hoisting works is now being laid. All the machinery is on the ground and it is thought tbat everything connected with tbe new plant will be ready for operation by September. Thirty men are working in the mine, but are doing development work principally, taking out only such quartz as is in tbe way. The object of this is to open up the mine so that a large force can be put to work and more extensive operations carried on.

WILL WORK THE COMET.—*Union:* A strong company has been formed to work the Comet mine. In early days this property paid well. There is a shaft 200 feet deep and a tunnel taps tbe ledge.

PUTTING UP MILLS.—*Transcript:* Everything is life and activity at the Spanish mine, above Washington. Men are busy erecting a ten-stamp mill and putting up four Huntington mills. As soon as the machinery is all in place tbe mine will be started up, as everything is ready to hegin stoping. This mine is owned by Fred Bradley, formerly of this city, wbo is at present superintending a big mine in Wardner, Idaho.

Placer.

ON THE DIVIDE.—There are more prospectors on the Forest Hill divide than before in years. Tbe Hidden Treasure tunnel has been worked 9000 feet, but now operations are heing carried on at a distance of 3000 feet, where 150 men are employed. It is a low-grade mine, but the output is $15,000 a month. Operations have just been begun on the Mountain Gate mine, to the north of the Hidden Treasure, and the owners of the latter have purchased tbe Dam tunnel in order to open the ground on the south end of Mountain Gate.

Plumas.

DEVELOPMENT WORK.—A. U. Rugg, general manager of the Gold Bar Consolidated Mining Co., will do considerable development work on the middle fork of the Feather river this summer. Samuel J. Hendy, of the Joshua Hendy Machine Works, J. W. Patterson, J. H. Page, A. D. Moore and others are interested in this project, wbich comprises the working of seven gravel bars, stretching along the river five miles. A sawmill will be put up, a wagon road made, and the requisite machinery put in. It is calculated the enterprise will give employment to several hundred men.

San Diego.

THE GOLDEN CROSS PROPERTY.—Hedges, the site of tbe mines and mills of the Golden Cross Mining and Milling Company, is near Ogilby, on the S. P., 16 miles from Yuma. The company about two years ago bought thirteen claims and took up fourteen more, built a 40-stamp mill, with an engine of 120 horse-power, and began devcloping the low-grade gold ore property. The Queen mine has an inclined sbaft of 40 feet, with four working levels. The Golden Cross has a vertical shaft of 125 feet and an inclined sbaft of 180 feet. The Golden Crown has a shaft of 250 feet. The Talmage has a 50-foot vertical shaft, with a tunnel running into it of 260 feet. The Beecher has two tunnels, 80 and 60 feet respectively, the Ingersoll a tunnel 55 feet in length, extending through the mountains. The company is building a new 100-stamp mill, which will be in operation next month, with a Corliss engine of 300 horse-power, a surface condenser and air compressors for running power drills, and all modern auxiliaries, including an electric light plant. A six-inch pipe line is being extended to the Colorado river, twelve miles away, and 350,000 gallons of water will be pumped every twenty-four hours. The assays show all the way from $4 and $5 up. The bullion is shipped to this city. It is free milling ore.

Shasta.

ON CLEAR CREEK.—A. H. Fitch bas leased his stamp mill on Clear creek to G. W. McFarland and T. H. Pendleton, who are running the mill on ore from the Oro Fino mine. The ore mills about $10 in free gold, and the sulphurets are bigb grade. He has let a tunnel contract to W. H. Emmerson and James Johnson to cut the main vein of the Oro Fino, inside of 100 feet. Drifting on the vein will theu begin.

MIDDLE CREEK DISTRICT. — Diestlehorst Bros.' new dredge, now being built, will soon be ready for operation on the river bed near Middle Creek. Tbey are the first to have succeeded in a venture of this kind in the State.

THE DOG CREEK ANCIENT CHANNEL DRIFT GRAVEL MINE.—This property has been examined hy T. B. Smith, G. S. Deming, C. E. Brown and others, who consider it a property tbat can be cheaply developed. Tbe system consists of a lava-capped ancient channel overlying solidified slates. It has made three spills or deposits, viz.: Into Cbase gulch, which deposited into Dog creek; into McCall gulch, which also deposited into the same creek, and the third spill heing into the same creek at a point where the channel and Old Dog creek come together. At this point the channel leaves the creek and for one mile has not yielded a particle of its gold. At its outlet the Point just above the Sacramento river and Dog Creek it made its final deposit, which was very rich. The channel is easily traced from its head to the outlet, and is very easy of access. When one takes into consideration the small extent of channel which threw off so many miles of rich bars, beds and banks of the Old Dog creek, it is permissahle to assume that the lava-capped channel is rich. Every channel of a like character in our State has yielded well.

WORKING THE PROPERTY.—*Democrat:* There are hundreds of good ledges that show enormous croppings that have been passed by for years and considered valueless because they did not show free gold. Now the prospector is finding out that many of these ledges are of the richest; and there are also a great many blind ledges—that is, ledges that do not show any croppings on the surface. These blind ledges are frequently very rich and are true fissures.

R. G. Hart of the Texas Consolidated is putting in new boilers and will increase the number of stamps. In fact, bis intentions are to double the capacity of bis already large plant and add several large roasting furnaces.

C. Lane, who took a working hond on the Brunswick a short time ago, is working the property. This is one of the oldest quartz mines in Sbasta county.

The Washington people are making extensive improvements on their property.

The Shasta County Development and Mining Company are working their mines, the Alta group, in Flat Creek district, and will soon erect new machinery for development work. Several parties who have large ledges on wbich they have expended from one to two thousand dollars are anxious to have tbis company take bold of their properties and complete the work of development. This is the proper course to pursue. Tbe day for selling prospects and holes in the ground is passed, but developed mines are in demand and can be sold at a fair price.

Sierra.

THE SCOTIA MINE—At the Scotia mine, situated one and a half miles southwest of Alleghany, Smith & Craft are making a good sbowing after three years of hard development work. The vein runs from one to four feet, carryiug sulphurets and free gold. Tbe owners are contemplating the erection of a mill, water power being conveniently at the door.

Siskiyou.

PUMPS STARTED.—The mammotb pumps of the Espey, Hunter & Co. mines at Hawkinsville were started last Wednesday and worked very well, except that there was some leakage, to he remedied by packing, as anticipated. On next day the pump, baving been tightened, worked fine, raising a large body of water to the flume at tbe top of the hill, extending to the diggings, the height being nearly 500 feet, through iron pipe laid up the side hill, a distance of about 1100 feet horizontally.

Trinity.

Platinum is reported to bave been found in quartz near the bead of Packers' Gulch. Platinum in quartz bas frequently been reported in the northern part of the State, but on investigation it has almost invariably proven to be galena sulphurets; in fact, it has never yet been found in quartz in the United States, so tbat the above statement sbould be taken with considerable allowance, but galena sulphurets are a pretty good indication of gold-bearing quartz. The gold of Packers' Gulch is quartz gold and has not traveled far.

RICH QUARTZ ON LADY SLIPPER. — *Record:* At the Himes claim on Lady Slipper, between the North Fork of Coffee Creek and the Nash mill, they have recently struck a ledge 12 inches wide in a formation of serpentine and porpbyry, which, according to Selby, of San Francisco, goes $100 in free gold and $4.60 in silver. The gold is returned at $20 per ounce. If this proves to be the case, there is but one otber mine in California which can beat it for purity. The San Guiseppi, just outside of the town of Sonora, Tuolumne county, where it sometimes goes as high as $20.50 per ounce, pure gold, 1000 fiue, is worth $20.67 the world over. The Himes mine on Lady Slipper was prospected last year by Messrs. McLeod and Henderson, who on leaving, posted a notice that they had abandoned the claims, and that anyone who wished to locate tbem could do so, a permission which was takeu advantage of by the parties who made the recent discovery within a few feet of where McLeod and Henderson quit work. It is not very often that prospectors are so considerate to those who come after them, and the gentlemen named are to be commended for their forethought and consideration for others.

Tuolumne.

GENERAL NOTES.—*Democrat:* A $50,000 plant is about to be erected on the App mine at Quartz Mountain.

The Darrow Bros.' mine, situated one-half mile east of the Alameda, at Rawbide, and bonded to John Witney, is in bonanza. The strike was made this week, hut the extent is not fully known. It is said rock is heing taken out that yields $15 to the pound.

At the Dead Horse mine at Summerville a rich body of ore bas been discovered in the 1400 level.

ON INDIAN CREEK.—Doyle and Gould have a mine situated on Indian creek which has a free gold vein, samples of ore selected at random assaying well.

THE SHANGHAI QUARTZ.—W. A. Nevils and others have taken hold of the Shanghai quartz mine, a short distance above Columhia.

Yuba.

INACTIVE.—Mining matters at Smartsville are still in a lethargic condition. The Excelsior Company's mine is still inactive, but the company is expecting to be able to commence operations soon again. The Camphell mine is working about forty men.

NEVADA.

STOREY COUNTY.

THE BRUNSWICK PROSPECT.—In case of the prospecting operations now in progress on the Brunswick lode developing bodies of paying ore, writes Dan De Quille, in the Salt Lake *Tribune*, some of the other schemes now heing talked of will doubtless be pushed. Of these those that at present find most favor are the two drain and exploration drifts from the Sutro tunnel level of the Alta shaft, one to be run west to American Flat and the other south into Devil's Gate district. These drifts would eventually he about 6000 feet in length as planned at present, hut as both start in a favorahle formation and will constantly he advanced in a fertile formation within the Comstock mineral helt, they are liable at any time to cut into ore deposits of value. Almost at the start discoveries of importance may be looked for, and the two drifts through their whole course will be in ground liahle to contain ore veins. Something may be expected at ouce, therefore interest in the work will be kept alive from first to last.

At American Flat the formation is much the same as along the lode in Virginia City and Gold Hill. The Comstock lode has been developed and paying ore extracted almost continuously from Cedar Hill, just north of Virginia City, southward through Gold Hill to American Flat, a distance of about 20,000 feet. At the Flat progress southward as regards paying operations ceased. At tbat point a wide depressed area produced conditions unfavorable to further development. Tbe ground at this poiut is so situated that to tap and drain it to any profitable depth would require an immensely long tunnel, and the attempt to work it by means of shafts proved a failure, owing to the great amount of water encountered at a depth of from 300 to 400 feet. The most powerful pumps proved unequal to the task of bandling the great floods of water encountered. One company after another gave up the costly struggle, and finally American Flat was deserted.

It seems almost certain that a large hranch of the Comstock leads into and perbaps through the Flat into tbe hilly region lying to the southward, but at that great wet basin the work of exploration ceased, and for many years all that section has been deserted.

The proposed drain drift from the south hranch of the Sutro tunnel would make it possible to prospect and work the American Flat mines, and probably to trace the lode beyond that point. The Baltimore, Knickerbocker, American Flat and other mines on which work was done in the early days gave good prospects. A considerable amount of ore that paid $90 a ton was taken from tbe Baltimore, and also from the American Flat mine, au adjoining claim. The Rock Island was also once a claim of great promise, but it was drowned out at a certain depth, like half a score of its neighbors. Some portions of the upper sections of a few of thc old American Flat mines might perhaps now be profitably worked for gold. The croppings of the Baltimore yield no other metal, tbough at depth silver was found. The Rock Island is a vein of white quartz about 100 feet in width, heavily charged with iron pyrites, which would probably prove rich enough in gold to pay for concentration.

The Comstock lode consists of a system of fissures, in which are found quartz and more or less rich deposits of the precious metals. Very few of these fissures show on the surface, and many do not reach the surface by hundreds of feet. This being the case, no one knows where fissures of paying ore will be found; all that can be done is to run exploring drifts and trust to luck. As the drain drift to American Flat will be iu fertile ground from start to finish, it will be liable at any time to cut into paying ore.

OCCIDENTAL PROSPECTS.—*Enterprise:* The connection between tbe drifts on the 550 level of the Occidental mine and the winze sunk from the 550 level has been made, and now vigorous work on the prospect in that miue will be in order. This connection was important, as through it the air used in the work of prospecting these levels is largely drawn. The importance of this connection is uot generally understood by the stock-dealing puhlic, but the fact is it opens to active work the most favorable looking prospect to-day on the Comstock or in its immediate vicinity, so far as made public. The ore in this prospect was first encountered in a drift run farther west in the Occidental ground than any had ever been before. This drift cut a stringer of ore about eighteen inches wide.

A winze was then sunk to connect with the 550 level, and at the same time an old drift, run originally by James G. Fair when he was superintendent, was taken up and extended west to connect with the winze from the 500. It is this connection which bas just been made.

THE BRUNSWICK LODE.—*Enterprise:* Tbe question of taking water to the Brunswick lode, it is understood, is far from being settled. Whether it is most advisable to take water power to the lode by the way of a pressure tank, proposed to be built 700 feet southeast of the Combination shaft, or whether to take it direct from the Gold Hill tank, or whether to take to the Brunswick lode only such water as would be necessary to supply steam power at the hoisting works are the problems involved. It is understood that nearly everbody interested is in favor of taking water power out to the lode, as this water power, after having run the works at the lode, can be taken down incline No. 1 and thence to the Sutro tunnel level, where tbis waste water would again gain a head of 1340 feet—sufficient to carry on extensive mining and milling operations.

The question of getting water out to the lode is one upon which the success of the whole Brunswick lode enterprise may hinge, and its outcome is therefore watched with much interest.

THE SAVAGE MINE.—During the past fiscal year the Savage mine yielded 3758 tons of ore, of which 3187½ tons were milled at the Nevada mill and 781 tons at the Brunswick mill, the bullion yield of same heing as follows: Gold $15,755.20, silver $43,426.55; total, $59,-181.75; discount, $23,806.16; net cash received, $35,375.59.

WHITE PINE COUNTY.

THE JOANNA MINE.—A strike is reported in the Joanna mine. A drift has heen run 18 feet across the vein at the hottom of the shaft and how much farther they will have to run to get through the vein is not yet known. The ore is free and assays $50 per ton in gold. A ledge 18 feet wide and assaying $50 per ton in gold sounds very hig.

LINCOLN COUNTY.

STRIKE IN THE GAVELIN.—*De Lamar Lode:* In the progress of the present work on the

Gavelin property free gold was discovered on Friday. This is a most important development, as it goes to establish the existence of gold outside of the theoretical north and south ledges and ore bodies. The Gavelin ledge is located east and west and across the lower end of town.

OREGON.

AROUND BAKER CITY.—*Democrat:* The Red Boy mine at Granite is said to be netting $4000 a month.

The old pioneer producer, the Virtue, continues to make great strides.

A party of placer miners are operating on the Middle Fork, a short distance from Leadville, and they are said to be taking out $5 per day to the man. They have about six acres of ground.

The Robbins-Elkhorn is producing some good ore these days.

The Humboldt Mining Company, operating the large placer mine near Canyon City, will be forced to suspend operations soon, the water supply is failing at such a rapid rate.

It is said that the placer miners in the Granite district will not lay aside the pick and shovel until snow comes.

AT THE ASHLAND MINE.—Eight men, under Thos. James as superintendent, have begun work at the Ashland mine. The work will be prosecuted on the west side, where some of the richest rock yet milled from the mine has been opened up. The development there has filled with water since work stopped, and the first thing to do will be pumping out. Only a day force will be employed at present and a week or two will be required before a steady output of ore can be expected.

BAKER COUNTY.

THE BONANZA MINE.—The Bonanza mine has already produced more than $200,000 from the old workings and never looked better than at present. The country rocks are a series of slates, quartzites, limestones and serpentine. The vein occurs in black slate. It is very regular, and is opened for 1200 feet in length by two tunnels, respectively 125 and 250 feet deep. Two working shafts are started and are now each down 20 feet farther. There are three ore chutes aggregating 600 feet in length, and this is being daily increased as the lower tunnel is being driven ahead on from 8 to 10 feet of ore, which goes to the mill as extracted without sorting. The vein as stoped and milled has varied from 1 to 12 feet in width; it will probably average 4 or 5 feet throughout the mine. The ten-stamp mill is kept running constantly.

IDAHO.

THE BLACKFOOT DISTRICT.—While it is to quartz that Blackfoot looks for its future, the old placers are still being worked and some new discoveries are being made, 50 men having worked there this spring as long as water lasted, most of them with satisfactory results. Except in a few instances the water is too low to work in any way but a rocker, and little ground will pay with so slow a method. A little sluicing is still being done, but the two hydraulics on Jerome creek, four on Gold creek and one on Garden gulch have all been shut down for some time. Some of the quartz men own placers which they work for a living, putting in what time they can spare in developing their ledges.

A NEW EXCITEMENT.—Bonner's Ferry is almost depopulated, owing to excitement over an alleged gold discovery on Crawford creek, a tributary to the Yahk, about 20 miles northeast. Already a townsite has been staked off and christened Lemleyberg, after Lemley and Berg, the original discoverers. About 35 claims have so far been located. The ledge has been traced for over a mile and a half, and is from 8 to 20 feet wide, and assays have been obtained running as high as desired a ton.

AT WALLACE.—Messrs. Finch and Camphell have secured a bond on the Custer mine, situated on the east fork of Nine Mile creek, about six miles northeast of Wallace. They have put to work twelve miners, who will make room for a larger force in about two weeks. The Custer has been idle for over two years, though formerly it was one of the principal ore shippers, and it is hoped it will again resume its old rank as a large producer.

The Hunter Mining Company at Mullan is expected to start up before long.

The foreman of the Poorman mine has wired to Butte, Mont., for twenty machine men. A few good union miners can find work at Butte at union wages.

MONTANA.

THE OLD APEX QUESTION.—A Butte dispatch says: In the $400,000 damage suit of the Butte & Boston Mining Company against the Lexington Company for ores extracted from the Wapello, the attorney for the defendant has filed an answer from which it appears that when the case comes to trial the same old question of apex rights will be discussed in all its bearings. The defendant's answer admits taking ore from the Wapello, but claims the right to do so for the reason that the Lexington has been the owner of the apex of the vein for more than ten years. The Lexington people deny, however, that the value of the ore taken from the Wapello was greater than $2,343.62.

NEW MEXICO.

A NEW SMELTER.—A smelter organization has filed articles under the name of the New Mexico Mining, Smelting and Refining Company, with principal office at Cerrillos. Capital stock, $1,000,000. It is hoped to break ground by August 1st.

BODY OF ORE AT GOLDEN.—At Golden, Santa Fe county, in shaft No. 1 on the Pearl R. mine, a body of ore the full size of the shaft has been struck at the depth of fifty-four feet. It appears to be a great fissure vein. They have only found one wall, and the width of the lead as yet cannot be determined. The ore averaged $40 per ton in gold. So far as actually developed there is a square 200x150 feet, overlaid with a body of ore at least twelve feet thick, or, in round numbers, fully 15,000 tons virtually in sight, 200 tons of which is now at the mill and on the dump. Test runs of ore from different places gave returns of from $5 to $30 per ton in gold, and one mill run of eleven tons gave a result of $40 per ton in gold. In sinking shaft No. 2 to cut the ore body 100 feet above the first tunnel, the top of the ore vein was struck at a depth of ten feet, and a sample assay made from a piece of ore weighing at least 100 pounds resulted in yielding $211 per ton in gold. It is claimed this ore can be mined, hauled and milled at the maximum cost of $3 per ton.

COLORADO.

AROUND TELLURIDE.—There was a time when the ores from the Telluride district were carried on burros across the high range to Ouray, loaded into wagons and hauled 200 miles to the nearest railroad. Then only bonanza mines could operate. To-day many changes have come which greatly cheapen the cost of operation.

Mines located high amid the snowy peaks are worked by power supplied through small wires which run over ridges, leap chasms and scale dizzy precipices. Some mines a dozen miles away from the generating station thus secure a steady, uninterrupted power.

Another recent successful improvement which still further reduces the cost of mining is the endless wire tramway which supports buckets of a capacity of 500 pounds burden. The Smuggler-Union Company operates such a tramway from its tunnel in the Marshall basin down to the railroad, a distance of 6,000 feet. The buckets clutch the cable and by their own weight push the cable along as they descend from an altitude 2,000 feet above the town. The returning buckets carry to the mines the bulk of the supplies needed in development work. This does away largely with the burro trains. The tramway at the Smuggler-Union has a capacity of 500 tons of ore per day.

The third improvement to solve the problem of profitable mining is that of the concentrating mills, wherein the values of the ores are taken out and the invaluable parts washed away. Seven tons of ore are at the Smuggler-Union reduced to one containing all the values of the seven.

To set up dynamos, tramways and concentrating mills requires an outlay of money, however, and though mining in Telluride has been made extremely profitable by these improvements, the cost of establishment is great.

One of the big mines in Colorado is the Smuggler-Union combination. It controls the entire length of the greatest gold-bearing vein of the district, and includes the Mendota, Sheridan, Smuggler, Union, Seventy-six and Hermit mines—properties which in their history have produced over ten millions of silver and gold. Besides this great vein, with its many developed areas, a parallel vein which crosses the Smuggler vein is also controlled by the Smuggler-Union Company. This includes the Pennsylvania, Emerald, Revenue and Ansborough claims, none of which have been very extensively developed. An expert informed the writer that it is a safe estimate to say that the ore blocked out contains at the present price for silver, fully twenty million dollars in values.

On the Smuggler-Union property between 28 and 29 miles of tunnels, cross-cuts, shafts and drifts have been made. One cross-cut tunnel 3,500 feet long opens both veins for a depth of 1,250 feet below the surface; another tunnel 2,500 feet long increases the development 200 feet deeper on the vein. There are four shafts, 1,000, 700, 500 and 250 feet respectively, and between these the drifts connect at various stages, and all upon the vein which varies in width from three to five feet.

ARIZONA.

THE PLANET MINE.—A correspondent of the Phœnix *Herald* says: "The lucky owners of the Planet mine, situated in Fool's gulch, between the Congress and Yarnell mines, have struck it rich, 900 feet east of their main working shaft, at a point where the ledge cropped. But little oxidized iron ore had been found and stripped along the surface for about 80 feet. The ore is about two feet solid in place, and gold can be seen all through it. Samples along the ledge run from $175.50 to $1,120 per ton. It is the top of a new ore chute, and its extent has not been determined yet. The owners, Holtzschue, Clark & Co., are jubilant. It is a chlorider's paradise and a prospector's delight.

THE HARQUA HALA.—*Republican:* M. Gallardo reports an extensive as well as rich body of ore being struck in the Harqua Hala. Since the strike, the company is keeping a close guard over the property, and no one but employes are allowed around the dump. It is thought that the strike places the Harqua Hala mine on a good footing again.

BRITISH COLUMBIA.

NEAR CHRISTINA LAKE.—About 100 men are prospecting in the neighborhood of Christina lake, and in the search for quartz ledges are gradually working in a westerly direction towards Boundary creek.

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STATE ASSAY OFFICE,

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Analysis of Ores, Metals, Soils, Waters, Industrial Products, Foods, Medicines, etc., etc.
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Will act as AGENT for the investment of CAPITAL in RELIABLE Mining Enterprises, also will give attention to the sale of, and reporting on RELIABLE Mining Properties, or the procuring of suitable Machinery for Interest in Developed Mines.

Nevada Metallurgical Works,

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Established 1869.
ORES WORKED BY ANY PROCESS.
Ores Sampled.
ASSAYING IN ALL ITS BRANCHES.
Assays of Ores, Minerals, Waters, Etc.
WORKING TESTS (PRACTICAL) MADE.
PLANS AND SPECIFICATIONS furnished for the most suitable process for working ores.
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Everette's Mining Office.

(Pioneer Mining Geologist's Office of the Pacific Northwest.)
MINING LAW, MINE EXAMINATIONS, METALLURGY, ASSAYING AND ANALYSIS.
"Consulting Associate Mining Attorney at Law."
Will examine and report upon "Title and Exact Value" of Gold, Silver, Lead, Copper, Coal, Iron, Clay or other Mineral Properties IN ANY PART OF THE WORLD. Any information mining men may desire to know, relative to the MINERAL or COAL resources of the entire Pacific Northwest, will be honestly given.
Dr. Willis E. Everette,
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Analytical Chemists and Assayers,
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GOLD MINES OF ANY DESCRIPTION.
Specialty—Free milling quartz gold lodes and large bodies of hydraulic placer gold deposits. Prices low and easy terms. Big profits sure, as I handle none but dividend-payers and am careful in the selection of good properties only. Will examine and report on mines in this region or elsewhere. More than 20 years' mining and geological experience. Terms low.
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Inspect and report upon Mineral Properties, Treat Refractory Gold Ores and Concentrates by Chlorination. Furnish Plans for and Superintend Erection of Chlorination Plants, General Analyses of Ores.
References:
Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.
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Sole Agents for the Pacific Coast for the W. S. TYLER WIRE WORKS CO., manufacturers of
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Two No. 16 Becker Pulp Balance, each	15 00

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226 MARKET ST., N. E. Corner Front (Up Stairs), SAN FRANCISCO. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential.*

Electrical Progress.

The B. and O. Experiment.

The Baltimore and Ohio Railroad Company's use of electricity for hauling its heavy express and freight trains through a part of the city of Baltimore, over a new route opened for time-saving purposes attracts universal attention. One of the three 96-ton, 1,400 horse-power electric engines built for this service has been tested on the tracks on which it is to operate. This enormous machine stands 14½ feet high, and embodies a number of improvements in electrical mechanism. One of them relates to the method of communicating to the driving wheels the rotary motion developed by the armature of each of four motors. In ordinary street cars this portion of the motor is built around the axle and carries the latter with it, or else gears into the axle. But in the huge Baltimore engine the armature is mounted on a sleeve that loosely incloses the axle without touching it. At each end of the armature there are five stout radiating arms that fit into hollows in the interior surface of the drivers. This arrangement, combined with the springs by which the motor is suspended, protects the armature which is an elaborate piece of mechanism from the effects of the jolting.

But the most novel feature of the new plant, perhaps, is the form of the trolley and overhead conductor adopted. The latter, as previously stated, consists of an iron conduit, made of two bars of angle-iron and a cover-plate, bolted to, but insulated from, a crossbar. The road is a double-track road, and hence there are two of these conduits attached to the cross-bar. The troughs are not over the centre of each track, but a little to one side; in fact, nearly over one rail. In this lateral displacement the two troughs are moved toward each other. The current, which is brought from the power-house by cables to the iron conductor, is taken off from the latter by a brass shoe, a shuttle-shaped block sliding along in the trough and rubbing against the iron. This substitute for the old trolley wheel is attached, not to a pole such as on the ordinary electric car, but to a diamond-shaped frame, jointed at the corners in order to give it elasticity, and also mounted so as to swing sideways. Seen from in front or behind, this frame slants over a good deal, and it prevents the rocking and jolting of the engine from jerking or straining the connection with the shoe. One of several reasons for putting the electric conductor on one side is to keep it out of the way of freight brakemen's heads in the tunnel, where it is hung down within three or four feet of the level of the car roof.

Towing by Electricity.

The method by which it is proposed to apply electric energy for towing boats on the Erie canal is as follows:

A line of steel posts fourteen feet high and 150 feet apart is set along the bank of the canal. These posts carry two steel cables, the upper one being an inch and a half in diameter and the lower one an inch. A motor car is suspended from the upper cable, which bears the entire weight of the car. The motor is connected directly with the driving shaft, around which the lower cable is twice passed in such a way that the movement in either direction by the motor moves the car accordingly. The motorman has a seat in the suspended car, which consists of nothing more than a frame heavy enough to sustain the apparatus. A tow line is passed from the car to the canal boat, where it is made fast to the "sampson post," and the procession is ready to move. The motors are of seven-horse power, and can pull two or more laden boats. The electrical current is supplied to the motor through the upper cable, upon which the apparatus travels, and is returned to the power station through the lower cable, thus securing a perfect metallic circuit, which is said to be more economical than the circuits on most trolley street railways. A similar apparatus, it is said, is being successfully used in lumber hauling at mills in North Carolina.

What Blackens Incandescent Globes.

An Italian scientist has been trying to add to the comparatively small available store of information as to how the blackening of incandescent bulbs is caused. He found that under the microscope the surface of a used filament has little heaps, resembling in miniature those on the carbon of an arc lamp. They seem to have been produced by some melted material. In places the filament is furrowed by transverse cavities, out of which rise ramifications of lamp black. The film collected on the inside of the lamp shows under the microscope as a very thin coating of lamp black, in which are distinguished larger grains irregularly distributed, and also yellowish crystals. His explanation of the blackening is that certain mineral substances contained in the carbon filament become fused by the high temperature and evaporate. This causes a gradual disintegration of the carbon, some very minute particles of which are projected onto the glass. When the explosion of the little humps on the filament are at all violent, entire fragments are detached, and at these places where detachments occur most frequently the filament breaks.

Electric Power Salable.

An incident is reported from Niagara Falls, which illustrates the readiness of manufacturers to utilize electric power. It has been generally expected that Buffalo would be a large user of the electric power generated by the Cataract Company at Niagara Falls. Considerable delay has taken place in the negotiations between the city and the company for the power, and in the meantime another customer has arisen. According to a Buffalo paper, "While Buffalo is dickering for Niagara Falls power and talking about impossible restrictions, Depew has made a bid for it, and literally goes half way to get it. In all probability Depew will get the power before Buffalo does." As a matter of fact Depew, a growing town, eight miles from Buffalo, actually stepped in, and pre-empted a large amount of the power for which Buffalo was somewhat too complacently bargaining. The town has large locomotive shops, coupler works, etc., and in the acquisition of the new power it has made a big bid for prosperity.

In order to persuade a trolley current to effect its return along the rails, it is usual to connect the latter with copper wires called bonds. Great difficulty has been experienced in attaching a bond so that its contact will not be impaired by contraction and expansion, the jar of travel or rust and dirt. In what is called the "plastic bond," a new thing, a soft, paste-like compound is used to conduct the current from each rail to a flat iron bar or fish-plate, which is bolted to both rails as on steam railways. The surfaces of rail and bar are cleared by a scraper or emery wheel and then rubbed with an anti-rust amalgam or alloy. A flat ring of cork, five-eighths of an inch thick, and having an inside diameter of one and one-half inches, is then attached to the steel by means of an insulating cement. The core is filled with the plastic conducting material inclosed in a steel spring, which squeezes it out sideways, and then the splice-bar is bolted down over the cork and composition so as to make a perfect contact. It is claimed that bonds of this sort have been in use four years without showing deterioration. The plastic material always remains soft.

The Union Street Cable Road in this city is to be changed into an electric road. It is expected the work will be completed by March 1st, '96. The steep grades will be furnished in the same manner as that previously described in the case of the Fillmore Street line near Broadway.

THE WILSON
HIGH GRADE STEEL
SHOES
—AND—
DIES.



Guaranteed to Wear Longer and Prove Cheaper than any others.

Made by use of Special Appliances.

PATENTED AUGUST 16TH, 1892.

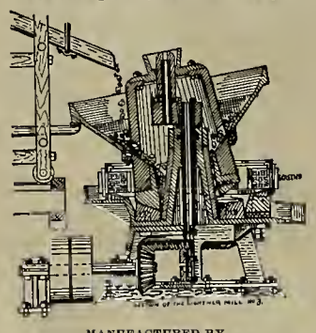
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Western Forge and Rolling Mills,

ST. LOUIS, MO.

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11 and 13 First St., San Francisco.

THE LIGHTNER QUARTZ MILL.
Something New, Good and Cheap.



MANUFACTURED BY
WM. H. BIRCH & CO.
Also Manufacturers of
Cary Steam Pumps, All kinds of Mining Machinery, Boilers, Engines, Ore Buckets, Ore Cars, Cages, Hoists, etc.
119 Beale St., San Francisco.

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☞ Our New and Revised Catalogue of Practical and Scientific Books, 88 Pages, 8vo., and our other Catalogues and Circulars, the whole covering every branch of Science applied to the arts, sent free and free of postage to any one in any part of the world who will furnish his address.

HOIST FOR SALE
CHEAP!

One single-drum water power friction hoist, with five-foot "Pelton" wheel arranged to work under a 660-foot head, and hoist from a depth of 400 feet. Load, 3300 pounds 300 feet per minute.

WILL SELL AT HALF COST; but little used, and works splendidly.

For further particulars apply to

PELTON WATER WHEEL CO.,
121 Main Street..... San Francisco
—OR—
Superintendent James Harry,
New Almaden.....California



—EASTERN PRICES BEATEN.—

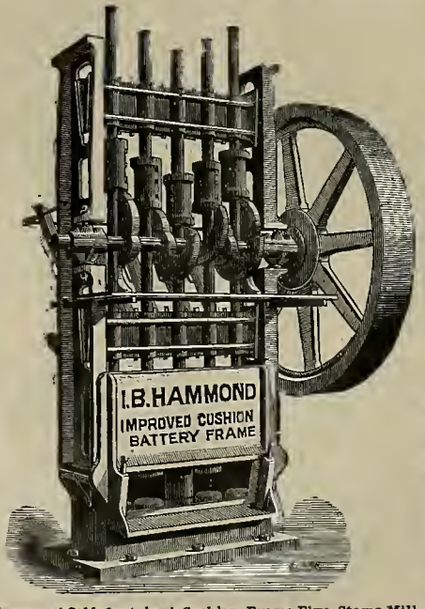
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Pioneer Screen Works!
JOHN W. QUICK, Prop.
Improved Facilities! Finest Work! Lowest Prices!
Perforated Sheet Metals, Steel, Russia Iron, American Planish, Zinc, Copper and Brass Screens for All Uses.
—MINING SCREENS A SPECIALTY.—
221 and 223 First Street, San Francisco, Cal.



QUARTZ SCREENS
A specialty. Round, slot or hurred slot holes. Genuine Russia Iron, Homogeneous Steel, Cast Steel or American planished Iron, Zinc, Copper or Brass Screens for all purposes. CALIFORNIA PERFORATING SCREEN CO., 145 and 147 Beale St., S. F.

MICHIGAN MINING SCHOOL, Houghton, Mich. A high grade technical school. Practical work. Elective System. Summer courses. Gives degrees of S. B., E. M. and Ph.D. Laboratories, Shops, Mill, etc., well equipped. For catalogues write to the Sec'y. M. E. WADSWORTH, Ph.D., Director.

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MANUFACTURERS OF
Stamp Mills, Ore Feeders
DETACHABLE BUCKET WIRE-ROPE TRAMWAYS,
Roller Grinding Pans, Desulphurizing Furnaces, Etc.



Improved Self-Contained Cushion-Frame Five-Stamp Mill.

The Improved, Iron-Frame, Self-Contained, Cushion-Frame, Five-Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space The Term "Self-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

FIRST: There is Saved by the Use of This Mill a Large Bill for Heavy Timbers, in Many Instances Obtained at Great Expense and Los Of Time.

SECOND: The Saving in Mill-Wright and Mechanics' Labor in Framing and Erecting.

THIRD: The Large Amount of Space Saved.

We refer by permission to Mr. N. A. McMillan, Haines, Oregon, manager of the Blue Mountain Mining Co., at Rock Creek, Or., where ten of our stamp mills are in operation; also to Mr. John S. Miller, Helena, Montana, manager of the Diamond Hill Mining Co., operating one of our forty-stamp mills at their mines at Townsend, Montana.

Send for Catalogue and Price List.
CORRESPONDENCE SOLICITED.

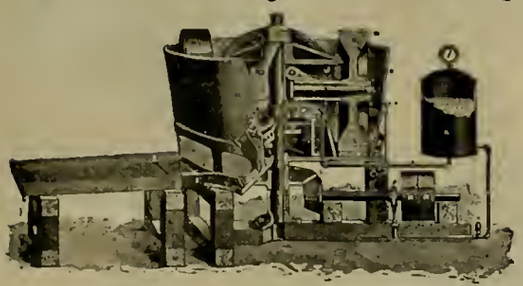
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TAUGHT BY MAIL THOROUGH PRACTICAL

Mechanics; Mechanical Drawing; Architecture; Architectural Drawing and Designing; Masonry; Carpentry and Joinery; Ornamental and Structural Iron Work; Steam Engineering (Stationary, Locomotive or Marine); Railway Engineering; Bridge Engineering; Municipal Engineering; Plumbing and Heating; Coal and Metal Mining; Prospecting, and the English Branches. Students make rapid progress in learing to Draw and Letter. Send for Free Circular, stating the subject you wish to study, to

THE INTERNATIONAL CORRESPONDENCE SCHOOLS, Scranton, Pa.

Merralls' Hydraulic Quartz Mill



Superior to any other Wet Mill now in existence.

A PLAIN, CHEAP, PRACTICAL MACHINE

That will pay for itself in a short time by its very high percentage of gold saving.

W. A. MERRALLS, Inventor and Owner,

Room 12, Third Floor, Mills Building ..... San Francisco, Cal.

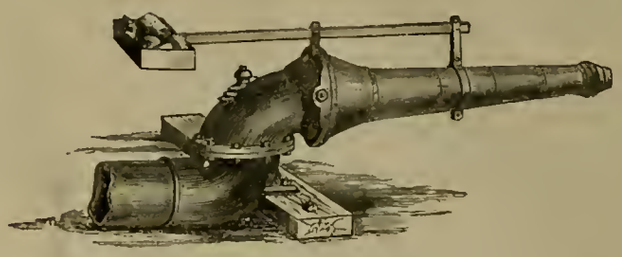
DROP FORGED MINER'S SPOON. Sample by Mail, 10c.



THIS CUT ONE-HALF SIZE.

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IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 42 Fremont St., San Francisco.

Mining Pipe!



STEEL OR IRON.—We make pipe of either, but recommend STEEL, it being superior to iron in many particulars and inferior in none.
COATING.—We use great care in COATING our pipe with a HOT solution of Double Refined Asphaltum and Maltha.
COMPETITORS.—Our competitors say we have the best appointed Pipe Shop on the Coast.

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MINING, IRON AND WOODWORKING
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BATTERY SCREENS AND WIRE CLOTH.
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Rock Drilling, Air Compressing, Mining and Quarrying
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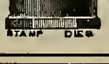
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CHROME CAST STEEL
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STAMP SHOES.



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These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

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MANHATTAN RUBBER BELTING, PACKING AND HOSE,
SANDERSON DRILL STEEL,
MORRIS CENTRIFUGAL PUMPS,
LIGHT STEEL RAIL.

Market Reports.

The Markets.

SAN FRANCISCO, July 25, 1895.

Copper continues to advance. It is reported that the Calumet & Hecla's sale at 10¾ was for 10,000,000 pounds. The half million pounds Lake sold in Boston last week was at 11¼, which resulted in putting it to 11½ there. The latest New York exchange prices are 11.40. Silver varies very little. Local markets are practically unchanged. Regarding coal J. W. Harrison's current circular says: "As the total arrivals of Australian coal since May 20th are less than 20,000 tons, the amount in yard at present is almost nil. Yet in the face of such slim arrivals, our yards are fully supplied with fuel for general uses, principally British Columbia products. With yards well filled and 165,000 tons listed from Australia and 130,000 tons from Swansea, the major portion of which should arrive here in six months, it becomes an assured fact that low prices must prevail. The strain for wharf and yard room will he felt in about ninety days hence, and all unsold cargoes arriving about that time will he the sufferers. It is reported that coal tonnage is not being freely offered for here for later loading; this may lead to stiffening of values after the turn of the year, as it is very duhious if seductive grain freights will prevail ahout Decemher or January next. Swansea coals are still offered for future delivery considerably helow Colonial; this handicaps any advance in the near future of all steam coals. The gas companies are now using hut little bituminous, principally anthracite and oil."

New York Metal Market.

NEW YORK, July 25.—PIG IRON—Scotch, 19@20c; American, 12@14c.

COPPER — Brokers', 11.00 @ 11.10c; exchange, 11.40c.

LEAD — Brokers', $3.20; exchange, $3.40.

TIN—Straits, 14.60@14.65c.

SPELTER—Domestic, $3.80.

New York Silver Prices.

NEW YORK, July 25.—Following are the closing prices for the week:

	—Silver in—			
	London.	N. Y.	Copper.	Lead.
Friday	30½	66⅞	11 00	.....
Saturday	30½	66⅞	11 00	3 20
Monday	30⅝	66⅝	.....	3 20
Tuesday	30⅝	66½	.....	.....
Wednesday	30⅝	66⅜	11 05	3 20
Thursday	30¼	66¼	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.88¼
London Merchants	$4.87½
London Sight Bankers	$4.90¼
Refined Silver, per ounce	66¼c
Mexican Dollars, nominal	54c

San Francisco Metal Market.

COPPER.			
Bolt	¼ & 5-16, 17c; ¾ and larger,		16c
Lake Superior Sheathing	18	@	—
Ingot, jobbing	—	@	14
Ingot, wholesale	13	@	12
Sheet copper	—	@	17
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
IRON.			
American Soft	14 00	@	16 00
Pig, per ton	15 00	@	18 00
STEEL.			
English, lb	14	@	16
QUICKSILVER.			
Home trade, per flask	41 00	@	— —
TIN PLATE.			
Per bx	5 25	@	6 00
COAL.			
SPOT FROM YARD—PER TON.			
Wellington	$ 8 00		
Greta	7 00		
Nanaimo	6 50		
Gilman	6 00		
Seattle	6 50		
Coos Bay	5 00		
Cannel	8 00		
Egg, hard	12 50		
Wallsend	7 00		
Scotch Splint	7 50		
Brymho	7 50		
TO ARRIVE—CARGO LOTS.			
Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lshigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

San Francisco Stock Board Sales.

SAN FRANCISCO, July 25, 1895.

9:30 A. M. SESSION

200 Best & Belcher	87	400 Hale & Norcross	1 30
100 Con Cal & Va	2 70	100 Mexican	67
50 Crown Point	37	200 Potosi	35

SECOND SESSION—2:30 P. M.

200 Belcher	31	100 Occidental	23
200 Best & Belcher	83	10 Ophir	1 25
500 Bulwer	04	50	1 30
150 Chollar	55	400 Potosi	34
250 Con Cal & Va	2 60	100 Savage	36
100 Gould & Curry	35	100	35
100	36	100 S B & M	09
215 H & N	1 35	200 Sierra Nevada	45
500	1 40	150 Union	44
250 Mexican	64	100 Utah	03
200 Mono	02	100 Yellow Jacket	37

WANTED.

A thorough miner, bookkeeper, assayer and millman desires position. Several years experience in California and Nevada mines as superintendent and foreman. Good references. Address J. S., 1133 Market St., Stockton, Cal.

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All kinds of tools. Fortune for the driller by using our Adamantine process; can take a core. Perfected Economical Artesian Pumping Rigs to work by Steam, Air, etc. Let us help you. THE AMERICAN WELL WORKS, Aurora, Ill.; Chicago, Ill.; Dallas, Tex.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Belcher S M Co., Nev	51	25c	July 16, Aug 20, Sept 10	C L Perkins, Mills Building
Best & Belcher M Co, Nev	58	25c	June 12, July 18, Aug 10	M Jaffe, 309 Montgomery
Bullion M Co, Nev	45	10c	June 12, July 17, Aug 7	R R Grayson, 331 Pine
Challenge Con M Co, Nev	19	5c	June 11, July 16, Aug 6	C L McCoy, Mills Building, City
Gold Bar Cons M Co., Cal	1	2c	May 24, Jun 29, Aug 21	E C Godfrey, Crocker Building
Gould & Curry, Nev	76	15c	July 2, Aug 6, Aug 28	A K Durbrow, 309 Montgomery
Hale and Norcross M Co	107	20c	May 29, July 3, July 25	A B Thompson, 309 Montgomery
H P Taylor M Co, Cal	—	4c	Apr 19, May 31, July 26	J Henry Smith, 431 California
Mono M Co, Cal	35	10c	July 16, Aug 15, Sept 10	M E Willis, 309 Montgomery
Occidental Con M Co. Nev	19	10c	June 25, July 30, Aug 21	A K Durbrow, 309 Montgomery
Ophir S M Co, Nev	66	25c	July 11, Aug 13, Sept 2	E B Holmes, 309 Montgomery
Potosi M Co, Nev	44	25c	July 14, Aug 14, Sept 4	C E Elliott, 309 Montgomery
Sonora Extended M Co, Cal	2	2½c	June 1, July 6, July 27	C A Stratton, 213 Jackson
Union Con	51	20c	June 18, July 19, Aug 15	A P Swain, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Lady Washington M Co, Nev	J E Jacobus, 309 Montgomery	July 31

Mining Share Market.

SAN FRANCISCO, July 25, 1895.

Stocks sagged worse than ever during the week, sales being almost lifeless. The condition of the street has nothing to do with the conditions of the mines listed on the Stock Exchange, which make a better showing than heretofore. This week the pendulum swung one way.

The Crown Point earned its expenses and a little more in June.

The following illustrates the changes of the week:

MINES.	18	25
Alpha	.....	.....
Alta Consolidated	.....	.....
Andes	$ 31	.....
Belcher	33	$ 31
Best & Belcher	96	87
Bodie	20	.....
Bullion	20	.....
Challenge	34	.....
Chollar	61	55
Confidence	.....	.....
Consolidated California and Virginia	2 80	2 70
Consolidated New York	.....	.....
Crown Point	41	37
Exchequer	.....	.....
Gould & Curry	46	36
Hale & Norcross	1 50	1 40
Justice	.....	.....
Mexican	68	67
Ophir	1 40	1 30
Overman	20	.....
Potosi	37	35
Savage	45	36
Sierra Nevada	58	45
Union	31	41
Utah	.....	03
Yellow Jacket	42	37

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 16, 1895.

542,920.—ROTARY ENGINE—D. Berry, Fish Rock, Cal.

542,701.—BITUMINOUS ROCK MACHINE—E. F. Badgley, S. F.

542,821.—HOP-TRELLIS—Boughton & Briggs, Clymer, Or.

542,796.—COIN RECEPTACLE—A. W. Coffin, S. F.

542,797.—ASH AND SOOT PAN—H. Colman, S. F.

542,798.—FAUCET—W. Curlett, S. F.

542,730.—ANIMAL TRAP—C. Fliedner, Portland, Or.

542,679.—TELEPHONE—Hopkins & Elsom, Spokane, Wash.

542,734.—DISH DRAINER—C. N. Johnson, S. F.

542,856.—SAW—J. W. Johnson, Truckee, Cal.

542,861.—BROOM—T. H. Palmer, San Bernardino, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from E. C. Kendall et al., in the Sharp Mine, near Brandy City, Sierra Co., to impound tailings in Sharp Ravine, an old pit, and on the bank of the north fork of the Yuba River; from W. R. Atkinson et al., in the Homestake Mine, near Gold Lake, Sierra Co., to impound tailings in a ravine; from Toland & Langdon, in the Corkscrew Placer Mine, near Spanish Ranch, Plumas Co., to impound tailings in ravine below the mine and on bank of Spanish Creek; from Henry Goering, in the Last Chance Mine, near Gold Lake, Sierra Co., to impound tailings in a dry ravine; from James Chapelain, in the Chapelain Quartz Mine, near Rackerby, Yuba Co., to deposit tailings in Honcut Creek; from Luigi Lagomarcini, in the Romonie Mine, near Loganville, Sierra Co., to impound tailings in an old pit; from T. T. Kirkham, in the Big Ravine Mine, near Blue Tent, Nevada Co., to impound tailings in ravine below the mine; from the Interior Development Co., in the Brown Placer Mine, near Michigan Bar, Sacramento Co., to impound tailings on flat ground near Arkansas Creek; and from the Cascade Water and Mining Co., in the Cascade Mine, Beckwourth Tp., Plumas Co., to impound tailings in Grizzly Creek, gives notice that a meeting will be held at Room 92, Flood building, San Francisco, Cal., July 29th, 1895, at 1:30 P. M.

WANTED!

A COMPETENT MILL MAN,

Who understands Vanner Concentration and plate amalgamation, as assistant in a 50-ton concentrating plant in northern Mexico. Salary $125 U. S. Currency per month. Must be thoroughly sober and well recommended. A married man preferred. Address B. D., care this office.

QUICKSILVER!

—FOR SALE BY—

The Eureka Company,

OF SAN FRANCISCO.

ROOM 1. · 426 CALIFORNIA STREET, SAN FRANCISCO.

Assessment Notices.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 25th day of June, 1895, an assessment (No. 19) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of July, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 21st day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

GOULD AND CURRY SILVER MINING COMPANY—Location of principal place of business, San Francisco, California. Location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees, held on the second (2d) day of July, 1895, an assessment (No. 76) of Fifteen (15c) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room No. 68, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Sixth (6th) day of August, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the Twenty-eighth (28th) day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 68, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California; location of works, Inyo, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 5th day of July, 1895, an assessment (No. 27) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 12, rotunda, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 8th day of August, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 4th day of September, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

W. W. SARGEANT, Secretary.

Office—Room 12, rotunda, Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

GOLD BAR CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 24th day of May, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
John E. Todd	5	2,500	$ 50 00
John E. Todd	6	2,500	50 00
John E. Todd	9	2,500	50 00
John E. Todd	55	2,500	50 00
Jas. P. McCarthy	13	625	12 50
Jas. P. McCarthy	63	2,500	50 00
Jas. P. McCarthy	64	2,500	50 00
Jas. P. McCarthy	65	2,500	50 00
Jas. P. McCarthy	66	2,500	50 00
W. A. H. Connors	14	625	12 50
W. A. H. Connors	52	1,800	36 00
John H. Page, Trustee	22	500	10 00
John H. Page, Trustee	23	500	10 00
John H. Page, Trustee	84	9,000	180 00
C. A. Moore, Trustee	28	5	10 00
C. A. Moore, Trustee	29	4,935	99 90
C. A. Moore, Trustee	32	16,666	333 32
I. N. Pattison	53	1,000	20 00
J. S. Herron	41	300	6 00
E. C. Godfrey, Trustee	54	6,000	120 00
E. C. Godfrey, Trustee	57	1,000	20 00
E. C. Godfrey, Trustee	58	500	10 00
E. C. Godfrey, Trustee	59	500	10 00
E. C. Godfrey, Trustee	60	200	4 00
E. C. Godfrey, Trustee	85	2,500	50 00
E. C. Godfrey, Trustee	86	4,000	80 00
Louise V. Rugg	36	10,000	200 00
A. U. Rugg	33	16,667	333 34

And in accordance with law, and an order from the Board of Directors, made on the 24th day of May, 1895, so many shares of each parcel of such Stock as may be necessary will be sold at public auction at the office of the Company, Room 38, Crocker Building, corner Montgomery and Market streets, San Francisco, California, on Monday, the 22nd day of July, 1895, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

E. C. GODFREY, Secretary.

Office—38 Crocker Building, San Francisco, California.

POSTPONEMENT.

By a resolution of the Board of Directors of the Gold Bar Consolidated Mining Company the day of sale of the above delinquent stock has been postponed to WEDNESDAY, August the 21st, 1895, at the same place and at the hour of 2 P. M.

E. C. GODFREY, Secretary.

Office—Room 38 Crocker Building, San Francisco, California.



AGENT IN SAN FRANCISCO:
NEWTON M. BELL, 109 California Street.

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To Rent or Buy

A DIAMOND PROSPECTING CORE DRILL

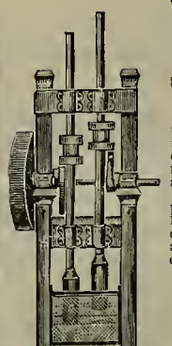
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Complete, in working order. To be run by compressed air and drill from 300 to 1000 feet. Give terms or spot cash price, and all particulars at once. "The Sullivan" preferred.

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The Briggs

TWO-STAMP MILL,



850-lb. stamps; weight of mill, 6000 lbs.

The most substantial mill ever offered to miners; discharges both ends and front; will crush from 6 to 10 tons per day; any one can set it up.

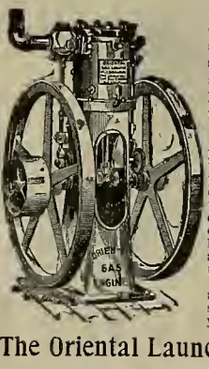
Complete as per cut, price **$450.00.** This mill is furnished with 9-inch cast steel shoes and dies, and substantial independent iron guides.

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Builders of all kinds of Saw Mill and Mining Machinery, Engines, Boilers and Special Machinery.

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IS THE BEST because it combines simplicity of construction with power and economy of space. It can be run with natural or manufactured gas or gasoline.

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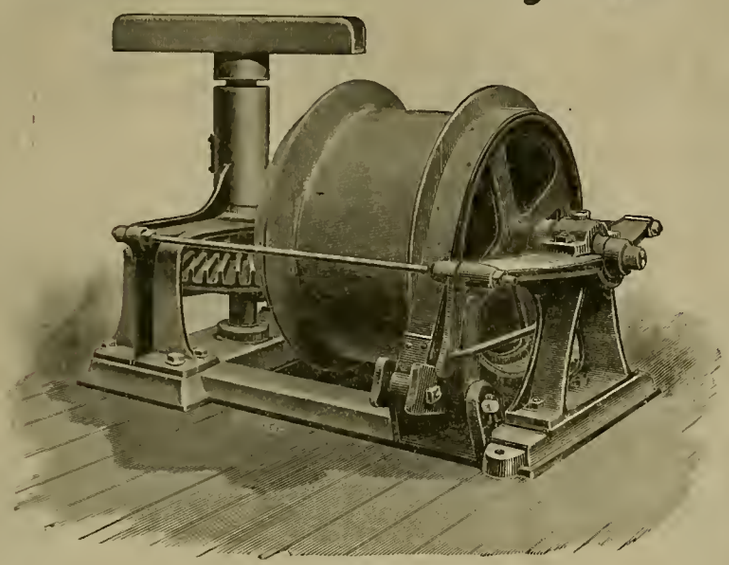
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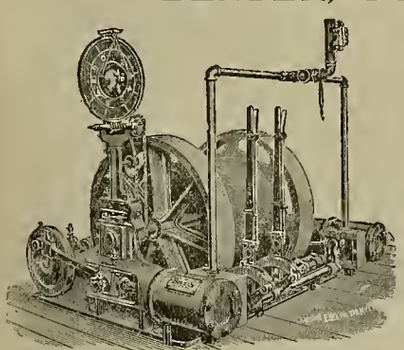
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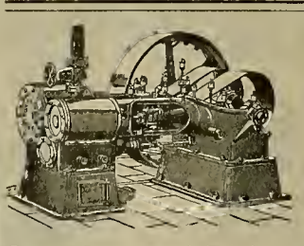
Sole Manufacturers of

Kendall's Patent Quartz Mills.

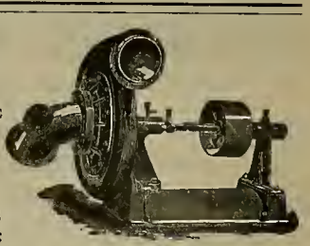
Having renewed our contract on more advantageous terms with Mr. S. Kendall for the manufacture of his Patent Quartz Mill, we are enabled to offer these mills at **Greatly Reduced Prices.** Having made and sold these mills for the past 14 years, we know their merits, and know that they have given perfect satisfaction to purchasers, as numbers of commendatory testimonials prove. We feel confident, therefore, that at the prices we are now prepared to offer them, there is placed within the reach of all a light, cheap and durable mill that will do all that is claimed for it and give entire satisfaction.

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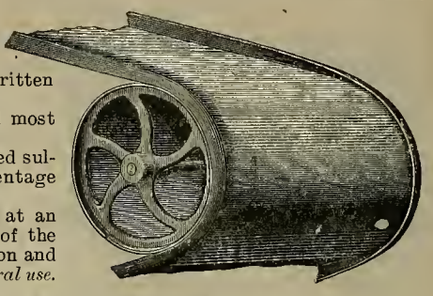
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We are now having our belts made by the best rubber manufacturers in New York and Boston, under written guarantees both as to quality and mechanical construction.

We have been granted two United States patents for improved devices in concentrating belts, the first and most important of which is for a slight riffling of the surface at intervals and crosswise of the face of the belt.

While these riffles are only about one-thirty-second of an inch in depth, they are very effective in saving floured sulphurets and reclaiming quicksilver and amalgam that may escape from the plates, thus gaining a large percentage of values that would go off with the tailings from belts with entirely smooth surfaces.

Our second patent is for an improvement in the flanges which practical mill men will appreciate. They stand at an acute angle inwardly, therefore they thoroughly confine the pulp on the belt; and in passing over the end pulleys of the machine, lie partly down, consequently do not crack or break, as do the old-style flanges; thereby much vexation and loss is avoided. *We keep in San Francisco and New York belts of all lengths and widths suitable for all concentrators in general use.*

BLASDEL CONCENTRATING BELT CO., HAYWARDS BUILDING, 419 CALIFORNIA STREET, SAN FRANCISCO.

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VOLUME LXXI. Number 5. SAN FRANCISCO, SATURDAY, AUGUST 3, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

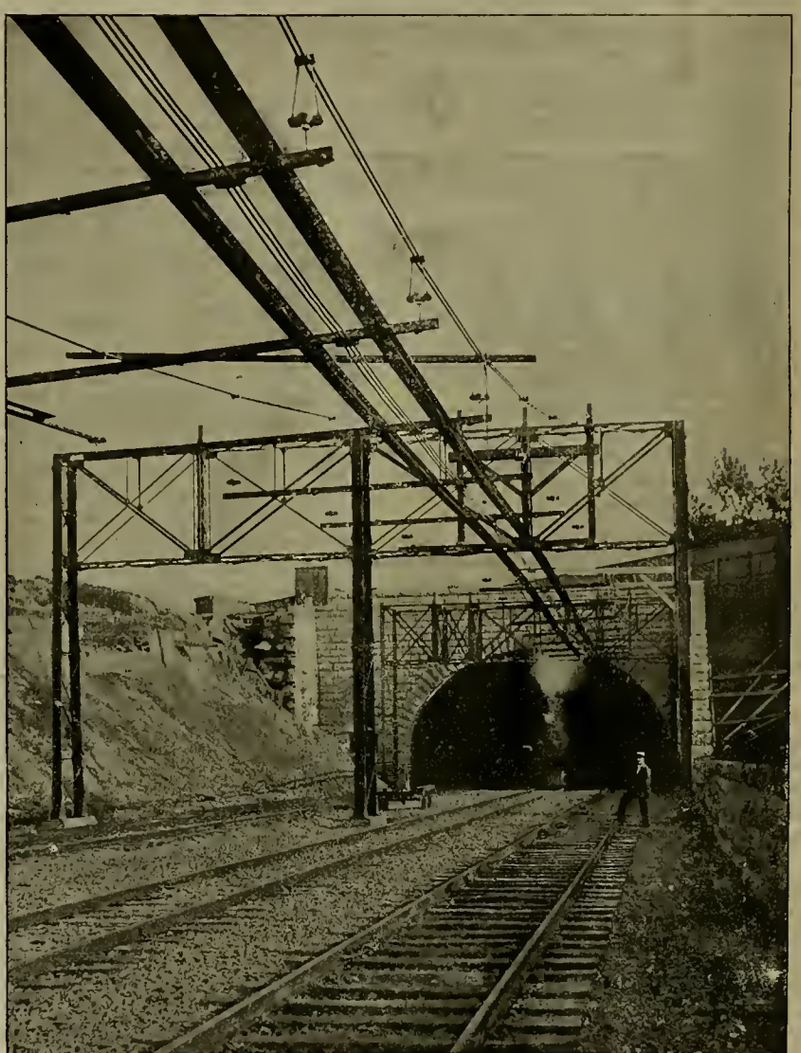
The B. & O. Belt Line Tunnel.

Much has been written about the suppression of the steam locomotive by the electric locomotive in railway service. The nearest approach to the actual substitution of electricity for steam in railroad work under ordinary conditions is found in the case of the belt line tunnel at Baltimore. An account of the work recently inaugurated there and of the plant by which the power is generated, transmitted and applied will be interesting to many of our readers.

Previous to the completion of the Baltimore tunnel, all trains of the Baltimore & Ohio road between Baltimore and the north were required to be transferred by ferry, to the great disadvantage of that road in point of time, other lines having an all-rail route through the city. The substitute for the ferry, and what is now known as the belt line, runs from Camden station to Bay View, a distance of a little over seven miles, and includes the tunnel. The tunnel has a length of 7339 feet, is 27 feet wide and 22 feet high, and was built through soft earth underneath Howard street in the center of the city. The cost was $225 per lineal foot.

It is understood, of course, that this line is to be used for the transfer of whatever trains running upon either end of the main line may require to be transferred, and the advantages of the use of some power other than steam, both in the tunnel and at the approaches in the heart of the city, are obvious. The work of providing an electric locomotive of sufficient power for the purpose was undertaken by the General Electric Company, after several other schemes of traction failed. This part of the work as well as the entire equipment was taken in charge and completed by that company. The specifications called for locomotives sufficiently powerful to push or pull passenger trains of 500 tons, including the steam locomotive, at a speed of 35 miles per hour, and freight trains of 1200 tons at 15 miles per hour, on a grade of 0.8 per cent. The plant was to cover the generation of power and current for lighting.

The northern section of the engine-room contains the lighting plant, consisting of eighty 50-light Thomson-Houston arc generators, and two alternators for the incandescent lamp service in the tunnel. The arc light machines are belted to two cross-compound 250-H. P. engines, $16\frac{1}{2} \times 23 \times 19$ inches. Two other engines of similar capacity drive the two alternators, and space has been left for an additional engine and alternator. Each alternating generator has a capacity of 2000 sixteen-candle power lamps, and as the tunnel is lighted by 1000 thirty-two-candle power lamps, one alternator will suffice for the present illumination of the tunnel. Facing the lighting plant, on the east side of the room, is the lighting switchboard, also of polished white marble. It consists of one standard, twenty-circuit, arc lamp plug board to which only sixteen circuits are at present connected; three alternating generator panels, one of which is left blank, and one feeder panel.



OVERHEAD CONSTRUCTION AT ENTRANCE TO BALTIMORE BELT LINE TUNNEL.



INTERIOR VIEW OF THE TUNNEL, SHOWING LIGHTING ARRANGEMENT.

From the positive bus on the railway switchboard, eight cables of stranded copper, each of 500,000 C. M. cross-section, or a total cross-section of 4,000,000 C. M., pass to the overhead structure immediately outside the power-house, where connection is made to three feeder cables, of 1,000,000 C. M. cross-section each, and to the overhead conductor itself, which has an equivalent of 1,000,000 C. M. cross-section. The negative bus is similarly connected to the rails, which are double bonded with No. 0000 wire, and also to the return cables laid in a wooden box beneath the tracks. Perfect contact between bonds and web is obtained by using a hollow rivet on each end of each bond and expanding it, when inserted in the rail, by means of a conical steel pin.

The distance over which the electrical locomotives will operate is about 15,000 feet, passing through two tunnels, 7339 feet and 265 feet long, respectively, and over 7396 feet of track in the open.

The most interesting portion of the installation is, of course, the locomotives. Electric locomotives of such weight and power had never before been conceived, but it has always been a rule in American electric railway practice from the beginning, to push ahead where improvements were possible and make the results realize the expectations, and there has been no departure from the rule in this case. The ninety-six-ton electric locomotive is a success.

The General Electric Company undertook the task of building these machines, and the tests made on the one completed, before it left the Schenectady shops, showed that it is fully equal to all reasonable require

(Continued on page 72.)

MINING AND SCIENTIFIC PRESS.

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J. F. HALLORAN.....General Manager

San Francisco, August 3, 1895.

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THE country seems to require the services of a commissioner of the general land office. At present that important position appears to be filled by an attache of the railroad company.

EL DORADO CANYON, the Mecca of many prospectors, is attracting renewed attention. Several different parties have gone in there during the month. It is where California, Nevada and Arizona come together and is a hard country to reach, stay in or leave.

ANOTHER statement about assessment work has been started and is appearing in several newspapers that assessment work for '95 must be done by October 1st. It would be just as well to have it done by that date, but holders of unpatented claims have till December 31st to do the required amount of work for this year.

Machinery, published in London, derides the statement in another London journal that the United States "excels England in the manufacture of machinery for mining purposes, and has distanced all competitors." *Machinery* claims that Great Britain furnishes more mining machinery to British colonial mines than this country does, which is so, and also claims that English mining machinery is superior to American, which is not so.

A VANCOUVER, B. C., JOURNAL asserts that if the proposed smelter is built there it will give steady employment to 250 men. Hardly; as a 100-ton proposition. The smelter now in operation at Tacoma, Wash., keeps a 100-ton stack going; under date of July 14th the secretary of the company writes us that their total pay roll carries sixty-two men. The Pilot Bay smelter is also of 100 tons daily capacity, but gives employment to about the same number as the one at Tacoma.

W. HAMILTON SMITH, a former Nevada county miner since grown famous as a mining expert, is inspecting British Columbia mines. Mr. Smith's favorable report on the extent and permanency of the South African gold fields some time ago attracted considerable attention and continues to be quoted. It is perhaps news to many that, till recently, Mr. Smith had sundry shares in a South African mining corporation which he has entirely disposed of, selling them to other fortunate men.

THE *California Architect and Building News* for July has a good article entitled "What to Exhibit in Mexico." It shows how important in a business sense it is to every American manufacturer to make appropriate exhibit at the International Fair which begins in the City of Mexico April 2, 1896. This exposition is an opportunity for California to extend its trade, for all Mexico and Central America, and a large part of South America, will be represented there by the wealthiest and most enterprising of their citizens.

THE midsummer monotony of mining stock operations was varied during the week by E. S. Spring, who announced intention to bring suit against Superintendent Lyman, of the Con. Cal. & Va., to compel that official to give a detailed account of his management of mine affairs, an explanation of some of his reports and other matters. He claims that the superintendent has bought stock and worked the street and the mine to the detriment of the stockholders. He represents several thousand shares and will begin proceedings in the U. S. Circuit Court of Nevada.

THE register and receiver of the Sacramento land office have decided the Placer county contest against the miners and in favor of the C. P. R'y Co.—that is, in the face of facts, they decide that the Forest Hill divide is "agricultural land." The property has on it a valuable placer claim; another part of it has another claim bonded to the Gray Eagle Co. for $30,000, and a tunnel is being run. If that land is "agricultural," then the Idaho-Maryland mine is a potato patch and the Utica fit only for raising alfalfa. One is just as "agricultural" as the other. The law is all right, but its interpretation is an outrage upon human rights.

BY a travesty of justice and in defiance of the plainest provisions of the law, the miners' protests against railroad filings on "Clear List No. 54" have been disregarded by Commissioner of the Land Office Lamoureux, and over 200,000 acres in the counties of Placer, El Dorado, Sacramento, Nevada and Sierra have been adjudged as "agricultural land." Though within a defined mineral belt and expressly exempted by the very law invoked for their absorption, the U. S. official prostitutes his high position in technical quibbling. The railroad attorneys, including Mr. Lamoureux, and the railroad newspapers all say that this is "in accordance with law," when the most cursory reading of the law shows that the action taken by the Department is strained, biased and with evident desire to evade its plainly expressed mandate. The remedy lies in the Supreme Court. That tribunal has never been corrupted and can be depended upon to administer justice.

NOW and then the heart of humanity is thrilled by tidings of heroic action on land and sea in time of danger. Among those noble records are many instances of personal heroism on the part of miners. That action of Supt. Lane, at the Utica mine fire last week, is a case in point. Risking death he went 1100 feet underground amid flame and poisonous gas to save, if possible, seven fellow mortals, overcome in the burning depths, and brought them safely to the surface. There died at St. Mary's hospital at Virginia, Nevada, last week a man—Arthur Van Dusen—who deserves the same honorable mention accorded in song and story to earth's bravest. 'Tis now over thirteen years ago that a bulkhead in the Alta mine at Gold Hill, Nevada, burst, flooding the lower levels with scalding water. Seven unfortunate miners were entombed in a drift on the 2150 foot level, 1400 feet from the shaft; the end of the drift where they were was fourteen feet raise, and the water rose two feet above the level. Compressed air was forced into the drift and the pumps kept going. Forty-eight hours after the accident two men—Denis Callahan and Wm. Bennet—tried to reach the imprisoned men but lost their lives. No artillery flashing over conquered field ever sounded for greater bravery than that displayed by these men—their bodies were afterwards found with the flesh partially cooked. At midnight on the third day Van Dusen succeeded at peril of his life in reaching the men, and eighty hours after the accident he brought them out, starving, exhausted but alive. The coast rang with his praise, but with the modesty characteristic of men capable of such deeds, Van Dusen declined all testimonials, saying he had simply done his duty and was delighted that his fellow miners were saved. He continued to fill his humble position till a year ago, when his health failing he went to the hospital where he died. All honor to his memory and the memory of all such men!

The Argument in Full.

Reference was made last week to the brief forwarded by the chairman of the Protection to Mineral Lands committee, in the case wherein an appeal is made to the Secretary of the Interior from the dismissal by the Commissioner of the General Land Office of a protest against the issuance of a patent to the S. P. Co., for a tract of mineral land in the Los Angeles district. In response to numerous inquiries, the full text of the brief is published, which is a clear exposition of the entire case.

DEPARTMENT OF THE INTERIOR,
WASHINGTON, D. C.

In re
SUPPLEMENTAL CLEAR LIST NO. 22, SOUTHERN PACIFIC RAILROAD COMPANY, BRANCH LINE.
(Los Angeles District.)

Brief for Appellant, Edward F. Benjamin.

STATEMENT OF THE CASE.

This proceeding arises under the provisions of the instructions of the Honorable Secretary of the Interior to the Commissioner of the General Land Office, dated July 9, 1894. In pursuance of these instructions and by virtue thereof a verified protest was filed by the applicant against the issuance of patent to the Southern Pacific Railroad Company, a corporation, of the list of selections by such corporation made, embracing 24,901.52 acres of land situate in the Los Angeles Land District, and specifically described in said protest, on the ground that such lands, tracts and legal subdivisions are excepted from the grant to said corporation because such lands, tracts and legal subdivisions are mineral lands and more valuable for mineral than for agricultural purposes. A hearing to determine the character of such lands, tracts and legal subdivisions, therein specifically described, was prayed for in said protest.

This protest was dismissed by the said Commissioner on the ground that "It is not believed that the instructions of July 9th provided for hearings where large numbers of tracts, as in this case, were alleged to be mineral," and "while the mineral affidavit of the petitioner fully meets the non-mineral affidavit of the company's agent, filed with the list of selections, yet in view of the fact that the publication has been regularly made and no specific protest filed, the protest herein, in its present form, is not considered sufficient to warrant an order for a hearing as prayed for."

From that order of dismissal this appeal is taken.

ARGUMENT.

I.

Under the instructions of July 9, 1894, no discretionary power is vested in the Commissioner of the General Land Office to order or deny a hearing.

The Secretary of the Interior is the guardian of the people of the United States over the public lands. The obligations of his oath of office oblige him to see that the law is carried out, and that none of the public domain is wasted or disposed of to a party not entitled to it. He represents the Government, which is a party to interest in every case involving the disposal of the public lands. And the phrase "under the direction of the Secretary of the Interior" as used in Sections 453 and 2478 of the Revised Statutes with reference to the status of the Commissioner of the General Land Office is not meaningless, but was intended as an expression, in general terms, of the power of the Secretary to supervise and control the extensive operations of the Land Department of which he is the head. Knight vs. Land Assn., 142 U. S. 161.

The Secretary of the Interior, as head of the Land Department, issued certain instructions on July 9, 1894, in the matter of the selection by railroad companies of lands in satisfaction of their grants, which were to be observed in determining whether the lands selected were mineral or non-mineral lands, which were directed to his subordinate, the Commissioner of the General Land Office (Patterson vs. Tatum, 3 Sawy. 164), and which, among other things, contain the direct and positive command that said Commissioner shall order a hearing in the local land office in each case "in regard to lands protested, or contested, or claimed to be mineral, or concerning which *any suggestion* has been made, or report by the register and receiver as to their mineral character."

The Act of Congress making the grant to the railroad company excluded the mineral lands and the statute not having prescribed the mode of proving the character of land lying within the limits of a railroad grant, it is the duty of the Land Department to determine the character of such lands, and a regulation of the Department, if not repugnant to the Act of Congress, may permit this to be done by some recognized mode of proceeding.

The instructions were intended to give wide latitude as to the manner in which information of the mineral character of such lands could be conveyed to the Department, and a mere "suggestion" or "report" was declared to be sufficient to warrant a hearing to be ordered "*in each case.*" But the Commissioner refuses to order a hearing "*in this case*" because, he says, "it is not believed that the instructions of July 9th provided for hearings where large numbers of tracts, as in this case, were alleged to be mineral," as "it is the uniform practice of the office to require petitioners for hearings to specify the tract or legal subdivision alleged to be mineral," although he concedes it to be a fact that the "mineral affidavit of the petitioner fully meets the non-mineral affidavit of the company's agent, filed with the lists of selections."

An inspection of appellant's protest shows that it fully complies with "the uniform practice of the office" in this, that it contains a particular description of each tract and legal subdivision involved, and then "specifies" that *all* of such tracts and legal subdivisions are mineral lands and more valuable for mineral than for agricultural purposes. If *all* of these lands are of that character, and appellant alleges in his protest that he is so informed and believes, how can there be any segregation of that which is indivisible? or, how can it be held that there is a failure "to specify the tract or legal subdivision alleged to be mineral," when it is alleged that *all* the tracts and subdivisions *are mineral?* If "the uniform practice of the office" requires anything more than this, it requires that which is practically impossible. But "the uniform practice of the office" does not control in this class of cases, as they are governed by a special code of rules (July 9, 1894).

If the instructions are subject to construction they should receive a practical common sense construction with reference to the mischief intended to be remedied by the change—that is, the issuing of patent without the investigation and consideration which the public interest requires. Barden vs. Northern Pacific, 154 U. S. 288.

A mischief which will always exist as long as there are

any lands to be selected by a railroad company. If the Government continues to rely upon hearsay affidavits and reports of deputy surveyors "whose reports have no binding force," and to raise purely technical objections against the sufficiency of information which it has invited from the public at large and which is fully as definite as any furnished by the railroad company.

If, as the Commissioner finds, the protest herein "fully meets" the non-mineral affidavit of the company's land agent, the case, viewed in that light, is properly at issue, and its dismissal is merely an officious act on the part of the Commissioner; and the Secretary of the Interior would not perform his duty, stated in Knight v. Land Association, 142 U. S. 161, as the "supervising agent of the Government to do justice to all claims and preserve the rights of the people of the United States," by certifying the list until corrected in accordance with the discoveries made known to the department. Barden v. Northern Pacific, 154 U. S. 288.

But, whoever heard of a judicial tribunal dismissing a case *ex mero motu*, after finding that the pleadings on both sides "fully meet," but were not precise enough on one side to warrant the case being set down for trial, and therefore judgment must follow for the other side whose pleading is acknowledged to be no more precise! Yet such action would be analagous to that of the Commissioner in dismissing this protest for the reasons given. True, the additional reason is given that "publication has been regularly made," but persistent examination of the statutes fails to disclose any provision changing the character of land because of that circumstance. Congress never intended that the "uniform practice of the office" or "publication" of a railroad list of selections "regularly made" should have the effect of transmuting mineral land into non-mineral land or that a departmental regulation should add to the law, render its enforcement difficult, burden the proceedings under it with unnecessary expense and hardship or to encumber them with onerous and technical conditions. Anchor v. Howe, 50 Fed. R. 366.

The Commissioner also commits the mistake of supposing that these instructions are so ambiguous as to require extrinsic aid in their construction, and by ingenious refinement he proceeds to give them a meaning that the Secretary never intended they should have. The Commissioner's reading of these instructions leave it optional with him whether to order a hearing or not as he sees fit, although it is a well settled rule of law that directions in a statute which are of the essence of the thing to be done are mandatory and not directory. It is to be presumed that the Land Department has no favors to bestow and designs to inflict no arbitrary deprivation of rights, but the practical working of these instructions results in the bestowal of certain rights and privileges upon railroad companies which are obnoxious to their grants in making them the judges of their own cases by permitting them to file hearsay affidavits as to the character of the lands which they select for patent and which affidavits are taken as conclusive evidence that the lands are non-mineral in character and therefore subject to "approval and patenting as agricultural" regardless of their true character, unless a protest is filed which is sufficiently precise to warrant consideration by the Commissioner. In which event a hearing would be ordered to determine whether the land is "more valuable for mineral than for agricultural purposes," which is a distinction not drawn in the Acts of Congress, but which, says the Supreme Court in the Barden case, *ante*, "may be sound because of the difficulty which may arise in many cases to ascertain with accuracy whether the lands to be disposed of are to be deemed mineral lands or agricultural lands." But this difficulty is easily overcome by giving the affidavit of the railroad company's land agent a conclusiveness which is denied, and properly denied to a protest, even when it is deemed of sufficient weight to warrant consideration by the Commissioner.

The Commissioner's construction of what is required of a protestant is harsh, oppressive and unreasonable, is unwarranted by the instructions of July 9, tends to embarrass the administration of the law and diminishes the rights of the Government in the public lands by practically adding to the grant a right to lands which are expressly excluded from the grant.

II.

The instructions of July 9th, 1894, are beyond the proper scope of the jurisdiction of the Land Department.

The source of the right of the railroad companies to lands lying within the alternate sections granted to aid in the construction of the road is in the Acts of Congress making such grants, which expressly exclude the mineral lands from such grants; and in Barden v. Northern Pacific, *ante*, it is said that selections of the land by a railroad company, as a part of its grant, shall not, in any respect, change its purport and effect or eliminate any of its reservations; nor does it empower the officers of the local land office (or their superiors) to accept the list as conclusive with respect to such grant in any particular. The determination of the character of the land granted by Congress, in any case, whether agricultural or mineral is placed in the Land Department and under its direction and supervision the actual character of the land may be determined and fully established.

Among the questions, therefore, which the Land Department is called upon to determine, when a railroad company makes application for a patent for lands lying within the limits of its grants, is whether such land is agricultural or mineral in character. This duty is not performed in promulgating rules and regulations which provide for an arbitrary determination of the question without any investigation upon the part of the Land Department.

For instance, the rules and regulations of July 9, 1894, provide that if a railroad company selects lands that are not within a radius of six miles from any mineral entry, claim or location, they shall be patented as agricultural land, and if the lands selected are within such radius, then, unless objection is made within a certain time, they, too, shall be patented as agricultural land. That is to say: that under certain conditions all lands lying within the limits of a railroad grant are to be deemed and taken to be agricultural lands, regardless of their true character, although there is nothing in the laws of Congress which provide that remoteness or contiguity to a mineral entry, claim or location, cuts any figure in the matter or that all lands are agricultural if no one happens to assert that they are more valuable for mineral than for agricultural purposes. The acts of Congress excluding the mineral lands from railroad grants cannot be supplanted by a rule or regulation of the Land Department. The right to enforce and carry into execution by appropriate regulations every part of the provisions applicable to the disposal of the public lands is not a grant of power to legislate; to add to the law, it is designed that the permitted regulations shall be reasonable and within the limitations and intent of the statute in the enforcement of which they are designed to aid. Anchor v. Howe, 50 Fed. Rep. 366.

The rules and regulations of July 9th, 1894, vary, add to and encroach upon the law in providing that all lands lying within the limits of a railroad grant may be patented as agricultural land whether in fact mineral or non mineral in character, "for the grant only passes a title to non-mineral land, yet the patent may be conclusive in subsequent proceedings respecting the title," and the result is that while the Land Department cannot, theoretically at least, grant land, yet practically it grants to a railroad company the very lands which Congress says it must not have. It is the plain duty of the Land Department to make full investigation of the matter and assure itself that the lands embraced in a railroad list of selections are not of the prohibited class, and if the means are denied it, by want of appropriate legislation, of reaching a proper determination of the question it should not seek to supply the deficiency by declaring that all lands shall be considered as agricultural because of their position or the happening, or not, of certain contingencies.

The delay of the Government in issuing patent to a railroad company does not affect the power of the company to assert in the meantime, by possessory action, its rights to lands which are in fact non-mineral (Barden v. Northern Pacific, *ante*) and it therefore follows that no harm follows delay in issuing these patents and that there is no actual necessity for the summary proceedings provided by the rules and regulations of July 9th, 1894, which only serve to materially add to and enhance the value of the railroad grant without any corresponding benefit to the Government or people. "The mineral lands," says Mr. Commissioner Lamoreux, "should be preserved for our people, and there is no claim on the part of the railroads to obtain these sources of vast wealth not intended for them that should be tumored to the least degree beyond the law. This I say in no spirit of hostility to the railroad companies, but from a thorough conviction that the best interests of the Republic would be served by dividing this vast mineral wealth among individuals, rather than by allowing it by any means to fall into the possession and control of large corporations. It is not intended to be granted to them, and they should not be allowed to obtain it by default. Sufficient means of proving exactly what the character of the land is should be provided."

See letter from Commissioner Lamoreux to Secretary of the Interior, dated August 29th, 1893. Mis. Doc. 258, 53d Cong. 2d Sess. If no proper provision has been made for the determination of the question, then the railroad companies must await appropriate legislation.

Certainly "sufficient means of proving exactly what the character of the land is" is not "provided" by declaring it all to be agricultural land without even the semblance of an examination or the taking of any testimony upon the subject other than an affidavit from an agent of the applicant for patent based wholly upon something that some one else, more or less mythical, has told affiant, who, by the way, is presumably interested in seeing that his employer loses nothing by the proceeding. But the provisions of the rules of July 9th, 1894, concerning the action to be taken upon a suggestion made, information given or report by the local land officers, indicate that the Land Department believed that there was a "sufficient means of proving exactly what the character of the land is" had already been provided and at its command because it is not reasonable to assume that the expense of the presenting of proof thereabout is to be cast upon the local land officers, or upon a party making suggestion or giving information upon that point. But the vice of these provisions as of these rules and regulations generally is that, unless some one moves in the matter, the lands mentioned in the supplemental list are *ipso facto* agricultural lands, "while the fact remains that, under the law, the duty of determining the character of the lands granted by Congress, and stating it in instruments transferring the title of the Government to the grantees, reposes in officers of the Land Department." Barden v. Northern Pacific, 154 U. S. 288.

The passage of the Idaho-Montana Act was certainly an expression of the legislative mind as to the appropriate means for determining the question of the character of the lands lying within a railroad grant, which are diametrically opposite to the rules of July 9th in all essential particulars, but the Land Department has not seen fit to make any modifications in its practice, although there is not a single provision in such law regarding the classification of lands that could not be adopted by the department substituting special agents for the Commissioners provided for in said act, and confining their examinations to such lands as the lists of selections filed from time to time by the railroad companies should designate. Undoubtedly, such action would go far towards providing "sufficient means of proving exactly what the character of the land is," and do away with the objectionable features of the existing rules and regulations, which are not only detrimental to the interests of the Government and the miner, but are clearly void because in conflict with the granting acts of Congress by enlarging the grant to the railroad companies in stupendous fashion.

In conclusion, we respectfully submit:

1. That the rules and regulations of July 9th, 1894, are free from ambiguity in so far as they concern the duties of the Commissioner of the General Land Office and therefore are not subject to construction by him.

2. That the ordering of a hearing, being of the essence of the thing to be done, is mandatory and not directory.

3. That the "uniform practice of the office" in other cases has no controlling effect in the matter of ordering or denying a hearing herein, as it is governed by special rules.

Further, that the rules and regulations of July 9th, 1894, are void in that:

I. They conflict with the acts of Congress excluding the mineral lands from railroad grants, and enlarge and extend such grants by arbitrarily determining the character of all lands selected by a railroad company lying without a radius of six miles from any mineral entry, claim or location, to be agricultural lands, notwithstanding such lands may in fact be mineral lands.

II. They arbitrarily determine the character of all lands lying within a radius of six miles from any mineral entry, claim or location which are not made the subject of a contest, or a protest, or concerning which no suggestion is made, information given or report had as to their mineral character.

III. They provide a mode of proceding to divest the Government of its title without the investigation and consideration which the law and the public interest requires.

A. H. RICKETTS,
Attorney for Appellant, Edward H. Benjamin.

Concentrates.

THE Iron Mt. (Shasta Co.) mill shuts down this week, prior to change of location.

COL. BAKER, Minister of Mines, has started a mining bureau in British Columbia, with headquarters at Victoria.

SPOKANE, WASH., which is the natural commercial center of a great mineral area, wants to hold a mining convention in October.

L. P. DREXLER has bought from the Sunnyside Mining Co. the Sunnyside mine, on the north fork of Feather river, Plumas Co.

THE export of gold from Western Australia for the year ending June 30th, '95, amounted to 239,593 ounces—an increase on the previous year.

A LOS ANGELES MAN who thinks he has a successful process to work refractory ore has bought a Meadow Lake mine for $3000 and will experiment some.

DR. W. D. HUNTINGTON of Oakland, who owns seven acres near Lake Temescal, thinks he has a gold mine there. He has had an assay made of some quartz, which showed $8.50 to the ton.

PERMITS to operate the Last Chance mine, near Sierra Valley, were issued to Henry Goering last Monday, and to Lugi Lagomacini for the Roomie mine, Sierra county, by the Debris Commission. The Homestake mine, Gold Lake, Sierra county, and the Brown mine, Sacramento county, were authorized to erect restraining dams.

THE Cinnabar Mining Company of British Columbia has incorporated at Vancouver; capital stock $100,000. Retorts will be put up and the furnaces built. About fifteen men are engaged in connection with the property, which is on Copper creek.

THE Burton Electric Company was incorporated in this city during the week; capital stock, $1,000,000. Directors—G. C. Perkins, J. R. Kendall, Oakland; J. E. Richards, N. A. Harris, G. E. Davis, C. A. Warren, San Francisco; G. D. Burton, Boston.

THE Hydraulic Mining Company has incorporated at Portland, Oregon; capital, $25,000. Incorporators—J. D. Cook, G. E. Howland and H. N. Scott. Also, the Oregon Bonanza Mining Company, Grant's Pass; capital, $50,000. Incorporators—E. Wade, R. Brown, J. King and S. Baldwin.

THE Norman Mining and Milling Company, whose mines are at Ripsey, on the Gila, below Riverside, Arizona, has levied an assessment of $8 per share on the capital stock of the company, payable before August 6th. The money thus raised will be expended in the purchase of a 20-stamp mill.

THE production of gold in the Witwatersrandt, South Africa, district since regular returns were made in '87 is as follows: 1887, 23,155 ounces; 1888, 208,122; 1889, 369,557; 1890, 494,817; 1891, 729,238; 1892, 1,210,807; 1893, 1,478,473; 1894, 2,024,159; 1895 (six months) 1,113,547; total, 7,651,935 ounces.

AN item in last Saturday's "Concentrates" told of a shipment of Alaska gold to the Helena, Montana, assay office. Usually Alaska gold is sent to this city; the shipment in question was made by the North American Transportation and Trading Co., of which J. J. Haley, a Montana pioneer, is general manager.

THE Washington, Eureka, No. 9, and three other claims near Hornitos, Mariposa Co., have been sold to English parties for $100,000. The Washington has yielded well and has had considerable development work. The other claims have also been worked profitably. There is a 10-stamp mill on the Eureka and a 30-stamp mill on the No. 9.

THREE mining companies were incorporated at Spokane, Wash., this week: The Crown Point Mining and Milling Company, capital $1,000,000; the Kootenai Mining and Milling Company, capital $1,000,000, and the Iron Horse Mining and Milling Company, capital $1,000,000. Incorporators of all three—A. E. Humphreys, W. H. Yawkey, J. D. Farrell, B. E. Barinds and L. F. Gordoa.

THE twelve mineral commissioners appointed by Congress to ascertain the character of the public lands in Montana and Idaho are divided into four parties, three in Montana and one in Idaho. They have so far examined and reported on 30,000 acres out of a total of ten millions. The appropriation is limited to $20,000; the monthly expenses are about $4000. About one-fifth of all the land examined so far has been certified to be agricultural.

THE commissioners of Golden Gate Park are desirous of making a creditable display of minerals, rocks and ores of the Northwestern States in their new museum in this city, and have written to prominent mining men all over the coast for such aid in this matter as they may be able and willing to give. Any specimens of native minerals they send will be correctly labeled in the name of the donor and suitably installed. Wells, Fargo & Co. will carry free of charge all material intended for the museum.

THE production of refined lead in the United States in 1894 was 219,000 short tons. The product of 1893 was the largest on record—229,000 short tons. The lead markets of the United States are supplied from four sources—domestic mining, divided between the soft lead ores of the Mississippi valley and the silver-lead ores of the Rocky mountains; Mexico and British Columbia; base bullion sent from Mexico for delivering and refining in bond in this country; and refined foreign lead. The total domestic production for '94 is estimated at 132,700 tons.

W. LINDGREN, geologist of the United States Geological Survey, appointed by the Secretary of the Interior to examine and report upon the mineral character of School Section 16, within the corporate limits of Tacoma, has filed his report with the land office, in which he says the land contains an extremely small amount of gold, of no value for mining purposes. The land in contest was filed upon by John G. McBride in 1889, and has been contested since. The testimony at the trial showed the value to be a million dollars. The case has been argued before the Interior Department by Attorney-General Jones three times. The testimony at the last examination before the local land office was so conflicting that the Secretary of the Interior detailed Geologist Lindgren to make a special examination, as a result of which he says the average gold deposit is less than ten cents per cubic yard, while at the former hearings, in which McBride was charged with salting, McBride's experts testified that certain strata ran as high as forty-four cents per cubic yard.

"TO NO ONE THING the stockholders in the Anaconda Copper Company owe more for the tremendous dividends they have pocketed than to the economical and exhaustive manner in which a ton of ore from its mines is handled," says a Butte mining man. "There is not a scrap of waste. Even the water is, by precipitation, made to yield value that comes in the nature of a precipitate carrying from 75 to 85 per cent copper. This precipitation of the waters has been going on for about two years. That it could be done was discovered in a very peculiar way, and upon experiments that were very crude. The first to try it was a miner who knew but very little of the chemical relations of the metals, but who learned that a tin can or piece of iron thrown into the channel through which the waste water was discharged, would attract the copper contained in the water, and save at least a large percentage of it. Experiments followed, and soon every drop of water discharged by the Anaconda and St. Lawrence was being handled for the metal that was in it. Truth is, it is nothing less than a thorough solution of copper, running at the rate of about thirty miners' inches a day out of each of the mines. This volume is raised into tanks, charged with scrap iron and salt. From tank to tank the volume goes until it passes through a circuit of fifteen tanks, over 500 tons of iron, and through from 1000 to 1200 feet of fluming, before it is discharged, and after which it is as clear as coal oil. The contents of the water are now settled in the tanks, and one after another a tank is cut out of the circuit, the iron removed, the copper hammered off, sorted and shipped. It is through this that the least particle of copper contained in the bonanzas of the company is saved."

The B. & O. Belt Line Tunnel.

(*Continued from page 69.*)

ments of trunk-line service. The dimensions are as follows:

Number of trucks	2
Number of motors	4—two to each truck.
Weight on driving wheels	192,000 lbs. (96 tons).
Number of driving wheels	8.
Drawbar pull	42,000 lbs.
Starting drawbar pull	60,000 lbs.
Gauge	4 ft. 8½ ins.
Diameter of drivers	62 ins. outside of tires.
Length over all	35 ft.
Height to top of cab	14 ft. 3 ins.
Wheel base of each truck	6 ft. 10 ins.
Extreme width	9 ft. 6¼ ins.
Diameter of sleeve bearings	13 ins.

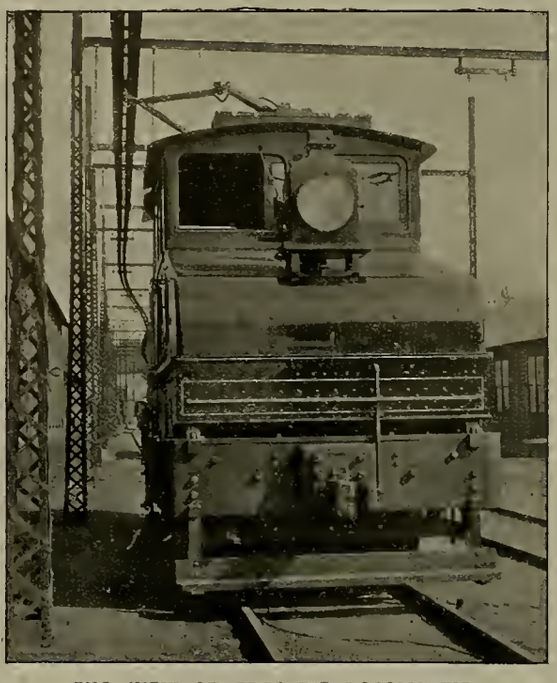
The driving gear cousists of a cast-steel spider shrunk on and keyed to a cast-steel driving sleeve, having a tensile strength of not less than 80,000 pounds. Each arm of the spider is provided with a double ruhber cushion, with a chilled cast-iron wearing cap, the cushion being forced into the arms of the spider and the cap. The eight driving wheels are of cast steel pressed and keyed to the axles, and have tires, three inches thick at centers of tread, shrunk onto the wheel centers. The driving axles are of special open-hearth steel. The journal bearings are outside the driving wheels and allow of easy access to all parts of the truck frame and driving hox. In the design of this are embodied the good features of the steam locomotive driving box and passenger car box. It is of cast iron, with a phosphor hronze bearing fitted on in a similar manner to that of a steam locomotive driving hox. It slides in jaws protected hy shoes in the same way.

The two opposite side frames of each truck rest upon four wheels, each consisting of one piece of hammered wrought iron three and one-half inches thick, to which the frame jaws are welded, and protected from wear by cast-iron shoes, and are connected together at the ends by heavy forged irou plates, with oak humper hcams between them.

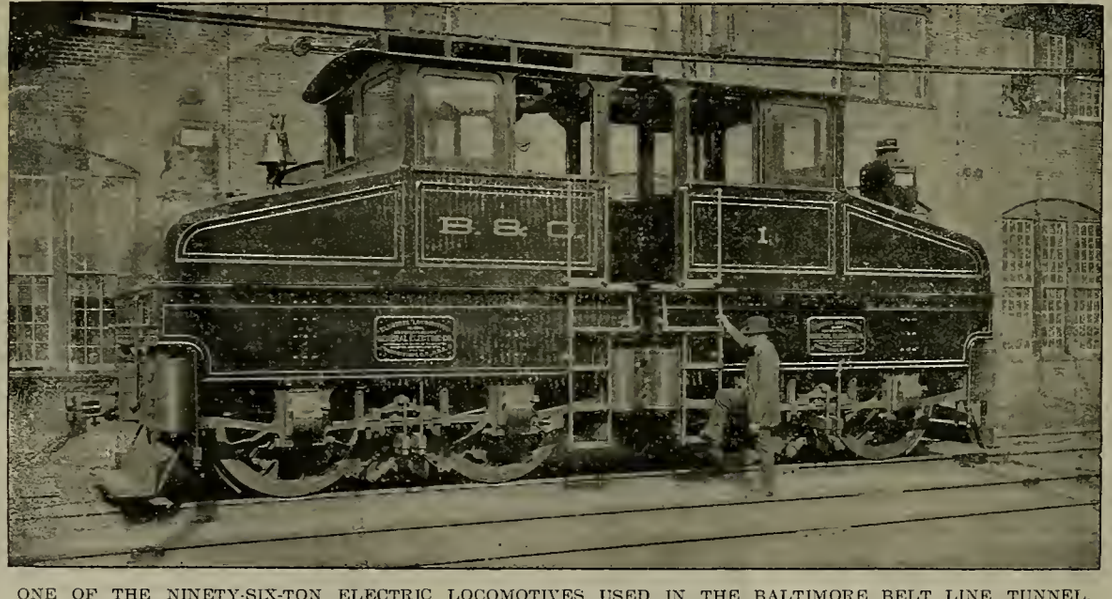
The motors are supported on carriers bolted to the field magnets, and rest in adjustable hangers carried on half-elliptical springs placed on top of the frame aud bumpers. The frames thus carry the motors by carriers and springs, and this load is carried in turn by rubber blocks in a cast-iron casing.

The gearless motors are four in number, two to each truck, flexibly supported aud transmitting their power to the wheels through the flexible connections described ahove. They are of pyramidal shape, are the largest railroad motors in the world, and, while ponderous in appearance, are by no means so bulky as might be expected from the heavy work they have to perform.

Each has six poles aud six sets of carbon brushes, the brushes being connected to a yoke revolving through 360° to facilitate accessihility to them. It is possible to remove four brushes without disahling the motor. The field spools arc encased in sheet-iron cases and fitted over the pole pieces holted to the field frame. The armatures are built of sheet-iron laminations, and are series drum wound. They are known as ironclad, each insulated winding being embedded in an insulated slot cut into the outer surface of the armature hody, and held therein hy a wooden key. This armature, with the commutator, is mounted upon and keyed to the hollow sleeve which is carried on the journals on the truck frame. The inside diameter of the sleeve is ahout two and a half inches larger than the axle. The entire motor is practically fireproof. When normally placed the motor rests in a position concentric to the axle, the clearance between thc axle and the sleeve allowing of a flexible support. The interposition of the ruhher cushions, through which the torque of the armature is transmitted to the driving wheels allows the armature to run eccentric to the axle, when the motor departs from its normal position on account of any unevenness in the track. The motor is designed to allow of ready removal of the field frame for inspection or repair. Each motor is rated at 360-H. P. and takes a normal current of 900 amperes.



END VIEW OF ELECTRIC LOCOMOTIVE.



ONE OF THE NINETY-SIX-TON ELECTRIC LOCOMOTIVES USED IN THE BALTIMORE BELT LINE TUNNEL.



INTERIOR VIEW OF POWER STATION.

Contact with the overhead conductor is effected hy means of a sliding shuttle-like shoe of hrass, which is fixed to a flexible support fastened to the top of the cab. This trolley support is diamond shaped aud compressible, contracting and expauding as the height demands, and is arranged to lean on oue side or the other of the overhead conductor. It is, however, rigid in so far as movement forward and hackward over the locomotive is concerned. The current is hrought to the locomotive hy means of cahles connected to the shoe and fasteued to the trolley support.

The conductor is simply a reversed iron couduit or trough erected overhead on trusses in the open and in the tunnel attached to the crown of the arch. In the open the couductor is directly over the center of the track; in the tunnel over the center line of the space hetween the tracks. It extends from Henrietta street on the south to Huntingtou avenue on the north, a distance of 15,000 feet.

The conductor consists of two 3-inch iron Z bars three-eighths inch thick, riveted to a cover plate one-quarter inch thick and eleven and one-half inches wide, and is constructed in sections thirty feet long. It weighs about thirty pounds per foot. At intervals of fifteen feet inside the tunnel there are suspended from the arch, transverse frames, consisting of two 3-inch channels, held together by plates four inches wide, and holding four castings into which are fitted conical porcelain iusulators. In the masonry of thc tunnel are fitted thc bolts necessary to support these frames. They are two and a half feet long, have split ends and extend twelve inches into the masonry. The holts pass dowuward through the outside pair of insulators. The bolts attaching the conductors to the channel frames pass through the iuside pair of insulators and support an iron stirrup in which the conductor hangs. This method affords a double insulation, and if leakage occur it can only be by the current passing the insulators between the conductor and the transverse channel, and theu the iusulation between the channel and the bolt in the tunnel arch. There may be a defective insulator either on the roof bolt or on thc bolt which supports the conductor, hut only when two insulators on the same transverse channel frame are defective will leakage occur. The height of the conductors above the level of the top of thc rails is seventeen and one-half fect in the tunnel, and they are fixed a little on each side of the ceuter line. This plan was adopted to avoid the risk of the conductors striking brakemen who might be standing on the top of passing freight cars. An additional precaution is provided in the shape of continuous wooden shields fastened to the iron stirrup which supports the conductors.

Outside the tunnel the height of thc conductors above the rails is increased to twenty-two feet. The supporting structure in the open consists of longitudinal catenaries of two chains of iron rods, having a span of 150 feet suspended from transverse trusses, supported by columns of latticed steel channels erected on either side of the douhle track. The catenaries pass over the top chord of the transverse

trusses and are fastened to a yellow pine timber post, acting as an insulation set therein. From the joints in the catenaries vertical rods are dropped at intervals of fifteen feet to support the electrical conductors. The vertical rods are attached to a casting holding a porcelain insulator, and through this a short bolt passes up to the joint in the catenary. The double insulation is secured by this vitrified porcelain insulator and the timber post, passing vertically through the transverse girder. A hood of galvanized iron is fixed to the top of the timber post. At the ends of the line an anchor pier receives the ends of the conductors. The trusses vary in length from thirty feet to sixty-two feet, the latter being required to span five tracks.

Upon the straight track the conductors are suspended from single catenaries, while upon the curves a double catenary is employed, and the conical insulator is inverted and supported in a casting bolted to the two vertical rods which drop from the catenaries. The vertical rods support a channel frame to which are bolted the conductors and the feeder cleats or clamps.

The feeder cables are of bare stranded copper of sixty-one strands each of 1,000,000 C. M. cross-section. These are supported in iron cleats fastened to channel frames riveted to the overhead conductors at points near to the heavier channels to which the conductors are suspended.

The lead-covered primaries for the tunnel-lighting plant are carried on posts set on the side of the cut, to the southern portal, where they drop to the tunnel and are carried upon porcelain knobs fastened to wooden blocks bolted to the masonry. At the points of support the cables are armored with wire to prevent abrasion. The secondaries are carried in cleats, also fastened to wooden blocks, similarly attached, and placed on either side of the tunnel about eight feet from the ground and fifteen feet apart. They are, however, staggered, and thus occur alternately at every seven and a half feet throughout the tunnel. Each block carries a lamp at its lower end, and is there cut out so that the lamp socket may be protected from moisture and dripping water from the tunnel walls. The lamps are thirty-two-candle power, fifty-two-volt Edison standard incandescent lamps.

The Game Laws.

The many twists and turns in the State game law in reference to the closing and opening dates of the game season have been a puzzle to many sportsmen.

It is a general belief that deer can be killed in any of the counties between July 15 and October 15, excepting in such counties where the Supervisors have shortened the time for the killing of deer to please the wishes of the sportsmen of their respective localities. The State law provides that it shall be unlawful to kill male deer between the 15th day of October and the 15 day of July and repeals all laws or ordinances in conflict therewith, but only such as are in conflict. It will therefore be seen that any ordinance passed by the Boards of Supervisors of the several counties of the State that is not in conflict with the State law is not repealed. It must therefore be remembered that the State law provides that it shall be unlawful to kill deer between October 15 and July 15, not that it shall be lawful to kill between July 15 and October 15. The Supervisors therefore have the authority to say that it shall also be unlawful to kill deer any other time between July 15 and October 15.

The new game law repealed only such acts and parts of acts as were in conflict with it. Section 29½ of the county government act gives the Supervisors power to pass ordinances for the protection of game and fish and that power has not been taken from them any further than to prevent a conflict with the State law.

All ordinances passed by the Supervisors a year ago or since that provide for an open season on deer whose limits are within the three months between the 15th of July and the 15th of October, and have not been repealed by the board, are not in conflict with the general law, and are consequently still in force.

AFTER a series of experiments running through a period of three months at the Boston Navy Yard, the Construction Bureau claims to have at last succeeded in finding a means of rendering the woodwork of the interior of men-of-war fireproof. The sap of the wood is extracted in vacuum in large iron tanks, and the pores are then filled under heavy pressure with a chemical composition of borax, boracic acid and muriate and sulphate of ammonia. Thus treated, it is said the wood may be subjected to flame without taking fire. The color and texture of the wood are unaltered.

A SUBMARINE TELEPHONE CABLE has been in operation between Montevideo and Buenos Ayres, South Ameriea, since 1888. It is thirty-one miles in length and lies at the bottom of the bay separating the Argentine Republic from Uruguay. It is said to perform its functions better than terrestrial telephones in that part of the world.

Sunshine in California.

TO THE EDITOR:—The Weather Bureau makes record of all meteorologic phenomena, among which is the record of the number of hours and minutes each day that the sun shone. This record is made by a photographic process or by an electrical register; each possesses merit, and both give very accurate results. Records of sunshine have been made at San Francisco since April, 1890, and a record has also been made at San Diego. At the other Weather Bureau offices in California no sunshine record has been made. However, as a record of the clear, partly cloudy and cloudy days have been made at all stations in California as elsewhere, the approximate amount of sunshine can be ascertained for all places in California in conjunction with the absolute sunshine record now made. This paper is for the purpose of disseminating such information concerning the record of sunshine in California as the Weather Bureau has so far collated. The rays of the sun are the life-giving properties to all living things. The existence of ourselves, our health, the germination, growth and development of all vegetation is dependent upon sunshine. The presence or absence of sunshine regulates, to a very great degree, the condition of the invalid and controls the actions of the healthy. Especially is the sunshine of value to the people of California in their vineyards and fruit drying. It is true that an excess of sunshine makes a country arid, a deficiency makes a country humid, but favored indeed is the country of a medium between these extremes. The records of San Francisco show that it enjoys on an average 58 per cent of the possible sunshine; that the month of June has the greatest amount of sunshine when the per cent of the possible amount is 70, and that December has the least, with 43 per cent. The amount of sunshine at San Francisco in December, 43 per centum, is, however, 1 per cent more than the average amount of sunshine that occurred in Cleveland, Ohio, during the year of 1893. The average amount of sunshine at San Francisco in the various months of the year, based on the past five years' record, is in per cent of the possible:

January	52.	July	69.
February	52.	August	57.
March	52.	September	61.
April	63.	October	64.
May	50.	November	57.
June	70.	December	43.

The average annual being 58, it is seen that from April to November, inclusive, there is more than the average sunshine, and less than the average from December to March, inclusive. These latter months are practically the months of the rainy season, yet the average sunshine for these rainy months is 50 per cent, and this average is more than the average annual sunshine over the New England and Middle States, and over Kentucky, Ohio, Indiana and the region of the Great Lakes, or more in San Francisco during the period of least sunshine than prevails on an average throughout the year over that portion of the United States where the population is the densest. It should be remembered that San Francisco is on the immediate coast, and that naturally more cloudy or foggy weather will there prevail than at places farther removed, hence a greater amount of sunshine prevails in the interior.

At San Diego there was 68 per cent of the possible sunshine during 1893, according to the figures taken from the latest report of the chief of the Weather Bureau. This report shows that August had 76 per cent of possible sunshine, April and October 75 per cent, July 73 per cent, November 71 per cent, February 70 per cent, September 69 per cent, January, May and December 66 per cent, June 61 per cent and March 56 per cent; or that at San Diego the least amount of sunshine in any month is in March, when 56 of the possible prevails. And this is a larger amount of sunshine than the average annual amount which prevails over all that portion of the United States east of the Mississippi river and north of a line drawn on the latitude of Omaha. On an average throughout the year 80 per cent or more of the possible sunshine prevails at San Diego from 11 A. M. to 5 P. M. At San Francisco from 70 to 78 per cent of the possible sunshine prevails from 11 A. M. to 5 P. M. It is to be regretted that there are no absolute sunshine records at Red Bluff, Sacramento, Fresno and Los Angeles. However, considering the number of clear and partly cloudy days at the various places, the approximate sunshine for each place is obtainable, and hence it can safely be assumed that at Los Angeles the per cent of possible sunshine is 70, at Fresno 66 per cent, at Red Bluff 65 per cent, at Sacramento 60 per cent, and at Keeler 64 per cent. The sunshine at Los Angeles, 70 per cent, is the greatest in the United States save over Arizona, New Mexico, Southern Kansas and contiguous sections, where it amounts to from 74 to 77 per cent of the possible, the greatest amount being at Tucson, where it amounts to 77 per cent.

The following data obtained from the annual report of the chief of the Weather Bureau, for the year 1893, the latest published, may in this connection prove of interest and of value, for it shows the main climatic conditions for the greater portion of California, as well as for the principal portion of the United States. The table is full of interesting deductions, which can be made by the reader.

DATA FOR 1893.

PLACE.	Sunshine per cent.	No. days clear, or partly cloudy.	No. cloudy days.	Total precipitation.	TEMPERATURE. Mean Max.	Mean Min.
San Francisco	60	235	80	17.91	69 1	48 5
Red Bluff	*65	305	60	24 36	71 7	49 5
Sacramento	*60	286	79	16 59	69 6	48 1
Fresno	*66	304	61	9 40	74 3	47 9
San Diego	68	316	49	10 29	68 2	53 0
Los Angeles	*70	321	44	21 96	72 8	50 2
Eureka	*40	214	151	53 71	56.0	45.2
Boston	53	240	125	41 84	55 3	40.5
Buffalo	47	239	126	38.64	52 8	33 8
Chicago	*47	254	111	27.17	52.9	39 2
Cincinnati	47	253	112	44 00	62.1	45.3
Cleveland	42	222	143	33.88	55 4	40 7
Denver	67	326	39	8 48	69 3	37.9
Detroit	48	234	131	34 18	54 5	39.2
Dodge City	74	329	30	10.12	68 3	41 0
Eastport, Me	45	228	137	39.87	47 8	34 2
Galveston	59	283	77	35 43	75 1	65 4
Kansas City	57	282	83	32.13	62.5	43 2
Memphis	60	282	83	44 45	70.6	52 0
New Orleans	52	289	76	48 02	76 8	61 9
New York City	*47	255	110	53 01	58 4	43 2
Philadelphia	49	229	136	37 65	60.7	45.2
Portland, Or	37	185	180	39.03	57.1	43.1
St. Louis	60	274	91	39.33	63.8	46 7
Salt Lake City	63	274	91	17.35	59.9	40.4
Santa Fe	74	334	31	14.94	60.1	38.7
Savannah	53	285	80	61.58	75 5	57.9
Tucson	77	316	49	13.12	81.9	50 4
Washington City	52	202	103	30.71	62.8	44 7

* Approximated.

B. S. PAGUE, Local Forecast Official.
Weather Bureau, San Francisco, July 20.

Boulder Burst.

In Morris Ravine, near the Goldeu Butterfly miue, there are some gigantie lava boulders weighing from 100 to 400 tons. They are as big as a small dwelling-house and for years have attracted the attention of travelers. On Saturday evening half a dozen or more children were playing beneath one of the largest rocks which stood on an open grassy spot some distance from the mountain.

A few hours later this rock burst asunder and fully 100 tons of the lava were thrown a distanee of thirty-four feet. The part remaining was estimated by Mr. Moody, superintendent of the mine, at 250 tons. There is no theory advanced as to the cause of the bursting of the boulder unless the extreme heat of the day—108°—had affected it.

There are hundreds of other big blocks of lava similar to this in the vicinity, and not one was ever known to break apart before. Had this occurred three hours earlier, some of the children might have been crushed to death.—Oroville, Cal., Register.

For Powder Smoke.

Having been greatly troubled with the vapors arising from continued explosions of giant in driving a tuunel on a southern Utah mining property, one of the pioneer miuing men of that territory has just discovered a very valuable neutralizer for the smoke and noxious fumes which would cling to the tunuel despite the presence of ventilating flues. He called some scieutific knowledge possessed by him into play and as a result now has little or no trouble with the vapors. With an ordiuary fruit tree spray pump the foremen in the tunnel blows lime water into the hanging smoke and gases and the lime neutralizes the latter to such an extent that the tunnel is rapidly cleared and the men may return to their work at the face. The lime water is made by slacking a small quantity of lime iu a bucket of water and of the latter but a small quantity is needed at each spraying.—Butte Inter-Mountain.

THE British Government moves steadily forward in extension of its dominion in Africa. Before the late parliament was dissolved it announced its intention to construct a railway from the eastern coast of Africa to Uganda, and to establish a protectorate over the country to the coast. With the unauimity characteristic of British statesmen in such matters, leaders of all parties readily assented and £30,000 a year are to be devoted to the expenses of the protectorate. The measure was passed by a vote of five to one. The explorer, Henry M. Stanley, who has been elected to the incoming parliament, has been urging this policy of railway construction as necessary for the redemption of Africa from the slave trade. The territory of the British East African Company is now transferred to the Government and all its property passes into direct control of the Crown. The territory extends 400 miles along the coast and reaches inland to the Congo Free State, embracing 1,000,000 square miles. It includes Uganda and the equatorial provinces.

THERE is mueh exeitement in England over the discovery that the Birmingham iron manufacturers have been making idols for the worship of the heathen of India. It is thought to be very wicked. But it is suggested that these iron idols take the plaee of other idols made of gold and silver. These will aecordingly be melted into bullion and coins as money. In that shape the old idols of the heathen will be worshiped actually if not literally by many who call themselves Christians.

From Steam to Electricity.

The Nantasket branch of the New York, New Haven and Hartford road has recently been changed from steam to electricity, and is now operating successfully under the latter power.

That electricity will eventually be the motive power of all great railroads is helieved by many railroad meu, but on the question of whether the time has already come for the great change they are in doubt. It is generally believed that the New York, New Haven and Hartford Company has made the test on one of the least used of its branch lines for a purpose of great importance. The new order of things has worked satisfactorily so far, and the line will be operated in the same way through the winter of '95 and '96. Then, if everything has gone as well as now, it would not surprise many people to see the power of the main line changed to electricity. When one important line has made the change, it is regarded as only a question of short time when all the other great roads will do the same. It will be the old story over again of the trolley supplanting the horse on the street railroads.

Electrical experts disagree on the maximum speed obtainable on the great railroads. Some of them claim that there is practically no limit to it, 300, 400 and 500 miles an hour being within the scope of possibility. Of course, such high speed would uever be utilized. Traveling at the rate of 200 miles an hour the motorman would have to begin to slow down at a point 20 miles before the objective stopping place. Then the possibility of accident would he greatly widened unless the road were fenced in, throughout its entire distance, and equipped with separate tracks for freight, way and express trains.

Already a speed of more than 80 miles an hour has been obtained on the Nantasket road, and the trains can be run as easily at 90 miles as at 80, but the road is comparatively short and hampered hy frequent curves except for a single long run at a point just below Nantasket.

There is little to suggest of the trolley in the construction of the road. In place of the girder, groove, stilt-like "T," or the other styles of rail in electric railways, there is used the conventional "T" rail employed hy steam roads. The rails weigh 75 pounds to the yard, and are of the type known as the "Old Colony section," 4½ inches high and are laid precisely as the rails of steam roads.

Two flexible copper bands seven inches long are under the base of the rails at each joint and riveted to them. The bonds are so placed that when the angle bars used in splicing the rails are in position the bonds cannot be seen. The length of the bond is reduced to a minimum to insure the maximum carrying capacity with a minimum of resistance.

The tracks are fifteen feet apart from center to center, and between the tracks is the single line of poles upon which are supported the cables and trolley wire cross-arms. The poles are 12 to 14 inches at the butt, and 10 to 12 inches at the top. They are painted black to a point six feet from the ground, and white to within one foot of the cross-arm, then finished hlack.

Four motor cars, built after the style of baggage cars, are the electric locomotives. To secure traction they have been made extra heavy, weighing, when fully equipped, about 60,000 pounds each. Two will have four motors each, and the others two motors each hung on trucks.

The cars have all standard appliances of the steam cars. In addition to a 15-inch goug at the front end of the motor cars, each of these cars has a chime whistle, worked with compressed air instead of steam.

Save for a single feature, there is not the slightest resemblance to the steam locomotive. That feature is the cow-catcher at both ends of the motor cars. It is situated underneath the platforms instead of projecting beyond the body of the locomotive, as with the steam locomotive. The wheels are about the size of the largest wheels used on steam cars, but the axles are considerably heavier, to withstand the strain of the electric gearing.

One of the reasons for selecting the Nantasket branch as the line for experiment is that within its short limits are coudensed most of the difficult problems which will have to bc solved before electricity cau be recognized as a successful substitute for steam. The grades are steep and the curves sharp and frequent. Trains are now running at short intervals on the road.

Obituary.

C. A. Luckhardt.

C. A. Luckhardt, metallurgist and assayer, died at his residence in this city last Saturday, aged 61. He was a native of Germany and for more than a generation had made his home here, where be was widely known. He was an honest, liberal-minded man, skilled in his business, and will be remembered by many old-time associates on the coast.

A NEW ORE of thallium, called borandite, has been found in Macedonia, associated with realgar. It is in the form of transparent crystals, varying in color from carmine to kermes red.

The Gold Yield of Europe.

TO THE EDITOR:—In you issue of the 20th inst. you give a tabulated statement of Europe's gold and silver yield in 1894. There is one serious error. Russia's production of $27,646,000 in gold comes almost entirely from her Siberian territory. Gold quartz was first found at Ekaterinburg, in the Urals, in 1745, but the tendency ever since has been for the center of production to move eastward. At the present time the Oural district, covering the Ural mountains, which separate Siberia from European Russia, produces barely one-quarter of the total yield of the Russian Empire and nearly all of this comes from the eastern or Siberian side of the border. The Irkoutsk district, in eastern Siberia, is the most productive. The mines of the Oural, the diggings on the Yenesei, those on the Olekma, have each in turn been the scene of maximum production, and each in turn has given place to some newly found region farther from Europe. Yours faithfully,

T. A. RICKARD,
State Geologist of Colorado.

Denver, Colorado, July 23, '95.

International Geographical Congress.

The Sixth International Congress of Geographers, which is now convened in London, is perhaps the most distinguished gathering of savants ever assembled. Men of world-wide reputation are there as delegates to exchange ideas and compare notes. The importance of the convention may be understood from the fact that the United States Government has decided to have a delegate present.

The list of honorary officials includes the presidents of all the geographical societieties in Europe, Asia and South America. For the United States Chief Justice Daly, American Geographical Society, New York; President George Davidson and Secretary John Partridge, Geographical Society of the Pacific, San Francisco, and Hon. Gardiner G. Hubbard, National Geographic Society, Washington, D. C.

London society will have its representatives in the Dukes of Westminster, Devonshire and Argyll, and others equally well known. Excursions to many points outside the city are arranged for the visitors, and every effort will he made to give them pleasant impressions of English hospitality.

"Value of a Ton of Ore."

TO THE EDITOR:—Replying to "Inquirer" as to small weights used in finding the value of a ton of ore, as set forth in your current issue, I advise adding one grain of silver to the ore before assaying, which will give a good-sized hutton for weighing and handling, and better attract the gold; this extra grain to be deducted when estimating the silver valuation.

Also, to hasten the silver dissolve out of the gold button, flatten it thin with a smooth hammer upon a smooth iron surface before placing in the nitric acid. $\frac{1}{10}$ of $\frac{1}{100}$ of a grain is $\frac{1}{1000}$ and its gold value to the ton of ore from 1 oz. avoirdupois is 1.37\frac{812}{10000}$. $\frac{1}{100}$ of $\frac{1}{100}$ of a grain is $\frac{1}{10000}$; its value to the ton of ore from 1 oz. av. is 13\frac{7812}{10000}$ cents.

Forty-six cents is the value of a ton of ore from $\frac{1}{100}$ of a grain of silver to the avoirdupois ounce, with silver at 69 cents an ounce, and not 60 cents, as by error in last number. A. H. J.

Salt Lake, Utah, Mines.

The following mining report of Salt Lake county, Utah, for 1895, has been prepared hy the Bureau of Statistics:

Mines in Operation in 1894.—Patented 82, not patented 125. Character of product—gold 14; lead, gold and silver 179; gold, silver and copper 14. Number of employees, 433. Total wages paid, $340,253. Output in tons, 39,125; value of output, $442,649. Value of plant, $681,195. Tons of ore concentrated, 17,794. Total value of all development work up to 1895 (partly estimated) $4,507,927.

Mines Not in Operation in 1894.—Patented 87, uot patented 82. Character of product—gold 13; lead, gold and silver 88; gold, silver and copper 23, gold and silver 20, lead and silver 25. Value of plant, $109,725. Total value of all development work up to 1895 (partly estimated) $593.926.

THE arrival at New York a few weeks ago of a steamer from the Argentine Republic with a cargo of 120,000 bushels of flaxseed has brought to light some interesting facts. It seems that quite a trade has been going on in seed from that far-away country for some time past, about 500,000 bushels of the Argentine seed having already been sold here. The flaxseed, although dirty, is reported to he very good in quality, and the price is equal to $1.28 per bushel, duty paid, the latter amounting to twenty cents per bushel. Crushers get a rebate on oil-cake exported, which makes the net price about $1.20 paid for the South American article. American flaxseed is quoted at $1.50 to $1.55, nominally. It is interesting to note that two years ago America exported large quantities of flaxseed; now she is importing.

Coast Industrial Notes.

—"Chicago, Kansas & California" is said to he the name selected for the reorganized Atchison, Topeka & Santa Fe Company.

—The West Shore Railroad Company has incorporated at Redwood, Cal., to build and operate a railroad from San Francisco to Santa Cruz, eighty miles.

—Ten carloads of California fruit left Sacramento last Tuesday consigned to London, England, hy special train, and is expected to he landed there in fourteen days.

—Tbe Oregon Railway & Navigation Company has entered into direct competition with the trans-Pacific lines running out of this port, and has cut the cahin rates to Yokohama to $85 and to Hongkong to $60.

—The directors of the Pacific Iron and Nail Works have concluded to rehuild the plant at Oakland. It has been decided to open the wire works department at once, and this alone will give employment to a large number of men.

—A. B. Hammond promises Astoria, Oregon, railroad connection next year. He says: "The entire road will be completed in 1896, and it is my intention to give to the people first-class service. The line will be constructed on a 16-foot roadbed, with 75-pound steel rails."

—The Northern Pacific Steamship Company announces tbat the flour rate by the steamer Evandale, leaving Tacoma today, will he $2, Mexican, per ton of 2000 pounds, from Tacoma. This is a fifty per cent cut over the former rate. It is only a few weeks since the rate was lowered from $6 to $4.

—As a result of tbe starting of a rock-crushing plant at Folsom the quarries in Alameda county, representing an investment of $500,000 and employing over 500 men, contemplate a shut-down. The owners fear that tbey cannot compete with the Folsom plant, whicb will be operated by convict labor.

—The Selby Smelting Company has made it possible for owners of mines in Shasta county to ship $40 ore at a profit. The company offers to work all ore assaying $50 per ton or less for $14.50 and pay freigbt charges. Heretofore freight charges and cost of working consumed all the profit on ore of that value.

—A syndicate formed recently for the purpose of engaging in the culture of canaigre in the Salt River valley, Arizona, has closed a deal for the purchase of 8000 acres of land near Phœnix. They have entered into a contract for the shipment of one carload per month, and the first shipment will he made about September 1st.

—Coast fir is now shipped in large quantities to the South African mines via Delagoa bay on direct orders, througb London agents, at prices averaging $10 per M., freight varying from 60 to 80 shillings. The superior quality of the lumber for mine timhering and house building bas created a new market for this coast product.

—A company has been organized in this city to develop tbe oil deposits of Guatemala, which are said to be extensive. They have exclusive government privileges, and will put on machinery to develop oil property in tbe vicinity of the city of Guatemala that is said to be able to produce 78 per cent oil that will find ready local sale at a very high price.

—It was Prof. Davidson, recently removed from his place in the Coast and Geodetic Survey, who persuaded James Lick to establish the great telescope that bears his name. The eccentric philanthropist was induced to give up a pet plan for a magnificent pyramid, to rival that of Cheops, only by Davidson's suggestion that a giant telescope would he a far grander monument.

—The East Oakland cotton mills are considering a move to Japan. Tbe company was organized twelve years ago with a $600,000 capital, and has given employment to 300 boys and girls at a time, but the future possibility of having to compete with prison labor and the setback given the industry of twine, rope and ore-bag manufacture gives the works no broadening outlook.

—In the case of the Judson Company against the Giaot Powder Company the Supreme Court has affirmed the decision of the lower ocurt. Three years ago there was a wrecking explosion at the Giant Powder Works and the Judson Company insisted it had suffered to the extent of $80,000 damages. In a suit it got a judgment for $40,000, and this the Supreme Court affirms.

—One of the deepest oil wells in Los Angeles, after considerahle preliminary grunting and grumbling, has started gushing oil at such a rate that it has overrun the neighborhood and is still flowing. The output is estimated to be about 800 barrels per day. Several owners of wells in the vicinity whose properties have been yielding fair returns have decided to stop present operations and dig deeper.

—The New Pedrara Onyx Company, which operated for some time at the onyx mines helow San Quintin, Lower Cal., has reorganized in Chicago with new capital. Plans have heen made for immediate work at the mines. One of the improvements on foot is a motor road from the quarries to the Gulf of California—fifteen miles—where a good harbor exists. Rock will he shipped thence to Guaymas, to he sent to Chicago via the Sonora railroad.

—The first shipment of lithographic stone from Arizona (1000 pounds) was recently made to the Los Angeles Lithographic Co. The quarry from whicb it was taken lies about three miles from Bumble Bee station, and is owned by R. Waldin and Edward Marlowe. The stone has heen subjected to severe tests and pronounced equal to the German stone, which has heretofore enjoyed a monopoly. The commercial value of the stone is about 13 cents per pound.

—The Union Stock Yards Company of Rodeo, Contra Costa county, will he foreclosed hy creditors to secure $250,000 worth of honds, most of which were floated in the East. The company was organized hy A. S. Garrettson of Sioux City, Silberhorn of Chicago, and other wealthy men. Garrettson and Silherhorn were the leading spirits. The value of the real estate of the Company is estimated at $156,500. It is incumhered to the amount of $435,995. The personal property is valued at $13,683. The dehts due, outside of tbe realty incumbrances, amount to $342,768.

—The Oregon Supreme Court has confirmed the sale of the Oregon Pacific railroad to Bonner & Hammond for $100,000. The sale of a property representing expenditures of fifteen millions of dollars in its construction for $100,000 is unfortunate for its creditors. The confirmation of the sale of the road extinguishes the honded indebtedness of $15,000,000 and interest, held in the East, and the $100,000 paid for the road is all there appears to be to satisfy the indebtedness of over $1,000,000 incurred hy the receiver since his appointment in 1890. The court tried to realize the expenses of the management of the property from the sale, hoping the bondholders would, hy reorganization, buy the property and pay off the expenses of the receiver's management, and fixed the minimum price at $1,000,000. and at another time $1,250,000, hut was unahle to effect a sale. The only remedy remaining was to sell the property for what it would hring, which, having been done, the sale was confirmed by a court that was acquainted with the property and must have known its value. The purchase is said to he hona fide, and it is said that John Claflin of H. B. Claflin & Co., New York, is behind the deal. Everytbing connected with the railroad, from beginning to end, bas been so muddled that no one outside of the lawyers in the case has any definite understanding of its affairs.

Mechanical Progress.

Standard of Horse Power.

Although the American Society of Mechanical Engineers has adopted a standard of boiler H. P., the old nominal H. P. based upon the amount of heating surface, is still very largely used, and whenever the word H. P. is used in connection with boilers, the matter must first be settled just what rating is meant. The American standard adopted was the evaporation of 34½ pounds from 212° to steam at 70 pounds. Some men rate their boilers on a heat-surface of 15 and some 12 square feet to a H. P. This fact is clear, that the boiler H. P. bears no resemblance to the engine H. P. The boiler that will just do for a simple Corliss engine would be equal to supplying twice as much H. P. to a triple-expansion engine, and would probably be too small to supply that power to a common slide-valve engine. This must be considered.

As the method of rating boiler power by heating surface is still so largely used it is a matter of some interest to note just how this method of rating compares with the standard rating by evaporation. Take a common tubular boiler rated by heating surface at 15 square feet per H. P. Will this H. P. rating be greater or less than the boiler will actually do by the evaporation standard? The assumption of 15 square feet as the basis makes the boiler have less nominal H. P. than if 12 feet had been assumed as the standard. This should be considered. When these ratings were made they were at the time when boilers were not so economical as now. The engine that used the steam required very nearly 45 to 50 pounds of steam per H. P per hour, and the boiler that would produce a certain H. P. in these engines was ascertained by direct use. The performance of the average tubular boilers varied little then, as it varies little now, and a certain boiler found capable to provide steam for the engine of a certain power at that time was designated as being a certain H. P. of a boiler, to correspond. Taking this as a basis the heating surface was divided by the H. P., and the quotient gave the heating surface of this type of boiler per H. P., and the rating was perfectly satisfactory, since if reversed the proper heating surface for that power of engine could be again found the conditions remaining practically the same.

As the economy of engines increased it was evidently observed that a boiler calculated upon this basis was underloaded and capable of more than supplying the new engine of the same power as the less economical one, and which previously the boiler had just fitted. This led to a revision of the rule as judged from the most recent practice, and the heating surface was again divided by the power the boiler could furnish steam for in the new engine, and the quotient gave a new rating of twelve square feet of surface to the H. P. Now it would be possible to carry this idea still further and involve another rule for the very economical engines of to day, and the rule might become six square feet to the particular engine power the boiler was supplying. The American Society standard settles this matter, but the old ratings are just as true and applicable to the type of engines that gave the original rating from which the rule was obtained. The 15-foot rule we believe to apply to the common throttling slide-valve engine, and the 12-foot rule to engines of a more economical type but not coming so low as a simple Corliss engine. Our experience in this matter has been this, that with horizontal tubular boilers, and no others are considered in this discussion, burning bituminous coal with a fair rate of combustion, that the actual H. P. by evaporation will be found somewhat in excess of the 12-foot rating. That is, a tubular boiler rated at 80 nominal H. P. could safely be depended upon to give 100 H. P. of the American Society standard, burning soft coal, without undue forcing, though running with open damper. If the rating is upon 15 feet, the H. P. actually obtained by evaporation will be considerably greater. Our experience with hard coal shows the 12-foot rating to be quite near to the evaporation standard, the power of the boiler under similar circumstances being reduced by the using of the harder fuel. With these assumptions it is quite possible to still use the old rules and estimate the value of the boiler, and how much engine power it will provide, when the economy of the engine is known approximately.

Cut and Wire Nails Compared.

At a recent meeting of the American Society of Mechanical Engineers in Detroit last month, a paper was read by R. C. Carpenter, recounting some tests made with cut and wire nails to to ascertain their relative efficiency. Comparison was made between the two classes with six-penny, eight-penny, ten-penny, and twenty-penny sizes. Enough of each kind to make a pound were driven into yellow pine of uniform quality, to within a quarter of an inch of their full length, and proper mechanism was attached to measure up the total force required in driving each class. Similar data were obtained regarding the operation of starting the nails and then pulling them. The result was that the cut nails were much harder to drive, and harder to start when drawn than the wire nails, but the latter, once started, were harder to pull out, and hence are ranked by Professor Carpenter as the more efficient nail. Why he should ignore the greater difficulty in starting the cut nails, though, is not quite clear; since in any structure put together with nails this is an important element of strength. In the same series of experiments it was observed, what almost every one must have noticed who has used the two kinds, that the cut nails in going in broke the fibers of the wood, whereas the wire nails, being pointed, merely separated them. Hence the elasticity of the wood remained greater in the latter case. As the cut nail had a greater surface than the wire nail, the former stuck tighter in starting, but after that the wood would press in against the metal during the rest of the pull, more firmly in the case of the wire nail than with the cut nail. This is the philosophy of the latter's inferiority when once loosened. Some experiments were made with carefully sharpened cut nails, and these showed a superiority over the ordinary blunt cut nail, both in starting and pulling. A sharp-pointed cut nail, then, would appear to be the best of all styles, except that there are not so many of them to the pound as there are of wire nails.

To Insure Tight Joints in Pipes.

In a great variety of industries it is desirable to transmit fluids of some kind (steam, compressed air, illuminating gas, freezing mixtures, or oil, for instance) under very high pressure. Unless the pipes which convey these gases or liquids be connected with one another very snugly, there will be a leakage at the joints. This means more than mere waste; it affects the efficiency of the plant, and may lead to corrosion and impairment of strength. A method of rendering joints tight, invented by A. J. Rossi, is simple and effective.

On the inner surface of the overlapping part of the joint, where the screw-thread is, he makes a groove, going entirely around, with a width of a quarter of an inch and a depth of about one-sixteenth. This recess is filled with a collar of lead. One or more holes are bored in from the outside and screws placed so that when they are turned they will squeeze the lead and force it to flow into any crevices between the underlying screw-threads. Any ordinary leak can be stopped effectively and quickly in this way. In most of the many tests made, bad leaks intentionally made were overcome in the face of 250 pounds or 300 pounds steam, 1,500 and 1,700 of air, 1,800 to 3,000 pounds of hydraulic pressure, and also of petroleum. In one of the experiments with oil the pressure was carried up to 12,700, and with water to 16,000 pounds to the square inch! A leak in an ammonia pipe was stopped so thoroughly that the most delicate tests with phenolphtalein paper failed to reveal any of the vapor outside the joint.

It might happen, from repeated tightenings of the screws, that they would get in as far as they could go. If a leak developed after this, it would be necessary only to remove a screw or two entirely for an instant and drop in small pieces of lead of the right size, to render the device as efficient as ever.

Scientific Progress.

Compressed Air in the Machine Shop.

One of several applications of compressed air in the handling or conveying of the different kinds of oil used about any establishment. Tanks for engine oil, lard oil, cylinder oil and lubricating oil are buried in the ground, convenient to the track where the oil is unloaded by running it into these tanks. The oil is forced to wherever it may be wanted, and compressed air delivers it there. By having the lubricating oil and the lard oil faucets in the tool room, each workman is supplied with his oil just as he is with any other tool, subject to an order from his foreman, and the splash and waste of high-priced lard oil is reduced to a minimum.

Did the reader ever have to fill his oilcan from a barrel of lard oil in the winter time, in a room with a temperature somewhere between the freezing point and zero? This operation always suggests the picture of a barrel with one head broken in, and a splinter of wood as a spoon, used for conveying the stiff lard oil into an oilcan through an orifice about one-quarter inch in diameter. Usually, while a small chunk goes into the oilcan, a large one drops on the floor, and the smear and waste is enormous. The compressed air arrangement not only abolishes this waste, but, by reason of the tank being buried in the ground below frost, the lard oil is kept liquid at all times. Moreover, this arrangement has the additional advantage of reducing the fire risk, and thereby lessening insurance rates, besides adding to the general neatness and systematic working of the establishment in no small manner.—C. O. Heggem in Cassier's Magazine for August.

Industries and Iron describes the new method of lining basic open-hearth furnaces recently introduced. Mixed with the usual basic materials, in a dry state, is mineral pitch, bitumen, or other solid mineral or vegetable fusible hydrocarbon, so that the compound does not become plastic, but remains in a powdered condition. In lining a furnace the latter is first heated to a high temperature, and the mixture of powdered basic material and pitch is then thrown into the furnace so as to be deposited where required. The pitch is immediately set on fire by the heat of the furnace, and serves to retain the mass of basic material in the spot to which it was directed when thrown into the furnace, whether the spot be on the bottom or walls of the furnace, the throwing-in of the mixture being continued until the hearth has taken the desired shape and size. The heat of the furnace burns away all of the carbonaceous residue of the pitch, and the basic material is glazed or burned on in a solid mass, so that the furnace is provided with a substantially pure basic lining. The basic material which the inventor prefers to use is the previously burnt dolomite, and the pitch is the ordinary mineral pitch of commerce. The basic material and the pitch can be ground together so as to become intimately mixed, or they may be ground separately and afterward mixed by sprinkling the desired percentage of powdered pitch among the basic material. The percentage of pitch may vary according to circumstances. Ordinarily from five to ten per cent will be sufficient.

Building a Steam Engine Fifty Years Ago.

First, a large drawing board was prepared, large enough to make a plan and side elevation, full size. Engines all being made very long stroke, the drawing boards were quite large, an engine of 14 inches diameter, 48 inches stroke, taking a board about 6x20 feet. The engine was plotted down, lines chalked and leaded; patterns were then made to correspond to the drawings, castings were made and fitted, but connecting rod, piston rod, valve rods, etc., were left till the cylinder guides and pillow-block were fitted on the bed plate. Measurements were then taken for the different rods, and the rods made the proper length to fit. No two engines were exactly alike; variations in shrinkage and fitting were adjusted in the length of the rods. Generally, after the first engine was made, the drawings were planed out, so that the drawing board could be used for another size. This destroyed the record of sizes; but as all rods were measured for each particular engine, this did not interrupt the work of construction. I need not refer to the present methods in this line, as you are all familiar with them. To-day almost every part of an engine or other machine could be made in different shops, widely separated, and then assembled into a complete machine without a hitch. This would have been impossible under the old plan. Taking all the disadvantages into consideration, the wonder is that the mechanics of fifty years ago could turn out as good machines as they did.—Robert Allison in Cassier's Magazine for August.

THE Royal Society of Belgium has published some additional facts in regard to the heretofore referred to process of welding of metallic bodies by means of simple pressure at temperatures far below their fusing point. In these researches the plan pursued was to put the metals in the shape of cylinders bounded by plain surfaces, great care being also taken as to their purity, and, having been mounted and welded together by means of a hand-screw, they were placed in a heating oven and kept at a constant temperature between 200 and 400 degrees for from three to twelve hours. The result, as detailed, shows that the most perfect joints were produced with gold, lead and tin, while the worst were with bismuth and antimony; two cylinders thus welded together could be put in a lathe, one of them only being held in the chuck, while the other was being worked upon by a cutting tool, without coming apart. They could be separated with the aid of pincers, but then a rough breakage was produced which did not coincide with the original plane of separation. It appeared, too, that the more crystalline the bodies the less is this phenomenon of incipient liquefaction exhibited, the commencement of its appearance in the case of platinum, for instance, being 1600 degrees below its fusing point—that such a liquefaction or softening actually took place being abundantly proved by experiment.

TO PREVENT the formation of scale in steam generators, A. Nieske, of Dresden, recommends the addition of chromic salts to the feedwater. The lime existing in the latter in the state of bicarbonate of sulphate is precipitated by such salts in the form of a non-adhesive light mud. Bichromate of potash may be used in the proportion of two pounds for a small boiler; but an excess of the salt would be attended with no inconvenience.

Electrical Progress.

The Electric Furnace.

One of the most beautiful processes in modern metallurgy is the melting of certain metals in the electric furnace, and it is now possible to project upon a screeu every phase of such an operation. Some idea of the wouderful play of colored light, which thus becomes so toned down as to be tolerable to the naked eye, may be formed by a description given lately by Professor Roberts-Austen of the projection of an electric furnace during the melting of metallic chromium. As the current is turued on, the interior of the furuace appears as a dark crater, the dull red poles revealing the metallic luster and gray shadows of the metal beneath them. Soou these poles are tipped with dazzling white, aud in the course of a few minutes the temperature has risen to about 2500° C. A lambent halo of green-blue now encircles each pole, the central band of the arc chauging rapidly from peach blossom to lavender and purple. As it becomes necessary to lengthen the arc, and the poles are drawn further and further asunder, the irregular masses of chromium fuse in silver droplets in the midst of light changiug from intense blue to green of lustrous emerald. Then the last fragments of chromium dissolve into a shining sheet, which reflects the glowing poles in green and gold shot with orange hues.

Professor Roberts-Austen adds: "Still, a few minutes later, as the chromium burns, a shower of brilliant sparks of metal are projected from the furnace amid the clouds of russet of brown vapors which wreath the little crater, while if the current is broken, and the light dies out, you wish that Turner had painted the limpid tints, and that Ruskin might describe their loveliness. The effect when either tungsten or silver replaces chromium is much the same; but in the latter case the glowing lake is more brilliant in its turbulent boiling, and blue vapors rise to be condensed in iridescent beads of distilled silver which stud the crater wall."

JAS. HOULAHAN has attracted some attention by his alleged discovery of a uew law in magnetism, wherein he claims that, by the use of an armature opposed to the magnet, non-magnetic metals—such as gold, silver, copper, lead, mercury, bismuth and others—will be attracted. The armature stated to be required is merely a plain piece of iron, such as the keeper of au ordinary horseshoe magnet. A feature claimed for the ore separator in which this idea is stated to have been embodied is that when gold and silver are found in the ore as sulphides or chlorides, passing them between the magnet and armature, it is alleged to liberate the sulphur and chlorine and to leave the pure metal adhering to the magnet. Whether this is caused by an electrolytic action or by the heat generated from revolving a powerful magnet in front of an iron plate is not known. The inventor's theory is that a static discharge takes place between the magnet and the opposed armature, which would probably make the action similar to that which takes place in electroplatiug. The difficulty seems to have been to keep magnets from setting up an arc between the pole pieces and the armature, which gave a heat great enough to cause fusion. This arc Mr. Houlahan says he obtaiued early in his investigations, aud it was ouly by taking off windings and a laborious system of experiments that the right point was reached. So far the discoverer or inventor's ideas have not attained much further endorsement than that accorded the multitude of new process meu.

CONSIDERABLE interest is manifested in the new telephone company's wire between Sacramento and Folsom, which is carried on the same poles as the wires over which the power is transmitted to the Capital City. Contrary to supposition, the telephone wire works satisfactorily, though the induction is so great in the case of the old company's telephone wire which runs parallel with the new line as to make the former practically useless. The new lines are not grounded, but operated by the transposition system.

A SMALL ELECTRIC LAMP is being used instead of a bell in several telephone exchauges. The call for connection lights the lamp.

SOME ONE has put a volume into a line by sayiug that "the brake is the best trolley car fender."

Practical Information.

New Wind Engines for Pumping.

A crude invention called the "Jumbo" wind engine is now coming into extensive use in western Kansas. Its ease of construction, economy in cost, capacity in power and simplicity, seem to recommend it to those who observe its work. It resembles the paddle wheel of a stern-wheel boat, with a shaft twelve to fourteen feet long, is twelve to sixteen feet across, with six or eight arms. The lower half of this wheel is shielded from the wind, so that the air acts only upon the upper vanes. A crank upon one end of the shaft counects with a pump. Its power can be indefinitely increased at any time by increasing its length, which can be done by any one who is handy with tools. It is said that a "Jumbo" giving 100 H. P. in fifteen-mile wiud can be put up at a cost of $500. The wind acts upon this sort of paddle wheel from all points of the compass except two. It seems to require no "goveruor," but simply pumps more during a storm. No tower is required, and it is placed so that the radial arms will be clear of the ground. In fact, in Kausas, where there are few trees and no hills, it is claimed that the wind currents have greater force at the surface than high in the air. One of these wind wheels now running in Kansas is 21 feet in diameter, 27 feet long, with eight fans. The largest water wheel in the world is an overshot wheel in the Isle of Man, recently illustrated and described in these columns, is 72 feet 6 inches in diameter, 6 feet in breadth, with a crank stroke of 10 feet. It gives 200 H. P. There may be many wind-power Ferris wheels in the States of the plains, bringing fertility where is aridity.

Perhaps in this crude device for raising water for irrigation in a wind-swept country there is the germ of an idea which, when fully developed and perfected, may become widely useful. If so, it will be quickly improved, for it is watched by many eager and anxious eyes, and now the development of an implement requires days where formerly centuries were needed. The crude "Jumbo" of to-day may become the perfected irrigating machine of to-morrow in level and treeless sections of country.

Bullets for the Navy Rifle.

As the result of exhaustive experiments in actual firing the Ordnance Bureau of the navy has determiued to reduce the weight and length of the ball for the new naval rifle from 185 grains to 112 grains. The firing tests have shown conclusively that the lighter ball is much more accurate than the present ball, and certain other advantages will be realized by the change.

It has put the ordnance officers to some trouble to reach a theory that will satisfactorily account for the paradoxical fact that a light ball is more accurate thau a heavy one, but they have done this by patient investigation. The idea is that the heavy shell, composed of a thin shell of plated steel eclosing the solder, by its inertia offers so much resistance to the sudden starting blow of the powder that it is what is technically known as "up-set" or shortened, and somewhat deformed before it leaves the barrel.

This deformation from a true cylindrical form is considered sufficient to account for an eccentricity of flight. It is quite certain that the lighter ball is truer in flight, for in the experiments with it at the proving ground, shooting at a target distant 1500 yards, five consecutive shots were placed in an 18-inch circle, and at 500 yards the same number of shots were lodged in a one-foot circle—a degree of accuracy that is far beyond that achieved with any other ball in a service weapon.

Besides lightening the ball, it is probable that the steel envelope will be made thicker, so that it will be less likely to mushroom upon striking a mark—a change that appears to be desirable in view of the trials of the army rifle. The light ball loses something in dropping after passing the 1000-yard mark, but within this range it actually goes straighter than the heavy ball in a vertical line, and by the aid of screens interposed at measured intervals between the gun and the target, it is found that at 500 yards the ball may be fired point-blank, or without raising the sight.

The Ordnance Bureau has also determined finally to make the barrel of the new rifle of nickel steel, which will be a distinct step in advance for the United States in gun-making. The barrels composed of this alloy, which have been shot thousands of times, show almost no wear or depreciation, and owing to the smoothness of the alloy in working it is believed that the barrels can be bored and rifled with great accuracy and ease.

As soon as the contract for the American rights to this new rifle are closed with Mr. Lee, the inventor, the Department will address letters to the big gun-makers of the country, inviting them to submit bids for the number required for the navy. It is expected that all of the sailors can be armed with the small-bore in the course of a year.

Deposits in Kitchen Boilers.

The deposits from water may be troublesome in many places, and most people are at a loss to understand how they occur. As explained by *Ironmongry*, all cold water absorbs carbonic acid gas from the air, of which the atmosphere always contains a small percentage. When water thus charged with carbonic acid ruus over lime or magnesia, or filters through earth containing these materials, it dissolves portions of them. When heated, the carbonic acid is driven off from the water, and as it is only by virtue of the presence of this acid that water can dissolve carbonates of lime or magnesia, these then resume the solid state, and, adheriug to metallic surfaces, form a scale almost precisely as tartar forms upon neglected teeth. It follows that if water be first heated before being fed to boilers, or if by chemical means the carbonic acid can be expelled, and time for the precipitatiou of earthy matters be allowed, the water will not thereafter form a mineral scale. While feed-water heating is practicable for power boilers, it is not usually so for kitchen boilers or for heating boilers. In places where only a hard water supply is available, it is better to use such form of boilers for each of the purposes as will admit of their interiors being easily cleaned. Some waters contain vegetable matter which forms a scale, or which, at least, mingles with the mineral scale. The latter is normally white, or nearly so. If it be mixed with matter of vegetable origin, it may have a dark color, often resembling chocolate.

NOTHING that has come to the front in late years has had more nonsense written and talked about than aluminum. Aluminum is a nice metal indeed, and has its uses, but when it is said it will supersede steel for structural purposes, that is saying too much. As compared with steel the tensile strength of aluminum is about one-third as great, and as it is, bulk for bulk, about one-third as heavy as steel, it follows that for equal strength the bulk of aluminum must be three times as great as that of steel. In other words, the weight of aluminum must be equal to that of steel in order that the tensile strength may be equal, so that for structural work, such, for instance, as bridges, it does not appear to have any place on account of lightness and would not, even at the same price as steel, come into use for such a purpose as bridge building, especially since it is weak under comparison, lacks rigidity and its elastic limit appears to be a variable and uncertain quantity. Some of its good qualities are its ductibility and its non-corrosibility under ordinary conditions. Should it come about that aluminum is produced at the same price as steel it will never to any noticeable extent rival the latter, but beyond doubt for certain purposes its use would be largely extended. As before said, it has its uses, but its value is not enhanced by writing and talking nonsense about it. In fact, its use is only retarded by such writing and talking, as men are induced to use it for purposes for which it is unsuited, the result being a prejudice against it for any purpose.

A Man of Titles.

"Giving the devil his due" is no light undertaking in Turkey. Whenever the name of the Sultan is mentioned, it must be after the manner of the following, which is literally translated from a Turkish paper:

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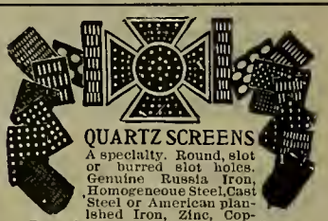
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Mining Summary.

CALIFORNIA.

Butte.

AN EXTENSIVE SCHEME. — The Golden Feather mine, comprising about a mile of Feather river bed near Oroville, will soon be worked out. In the opinion of Major McLaughlin, the manager of the company, it is advisable to generate electricity with the large water power at his command at the mine. The canal which was constructed to lay bare the bed of Feather river has a capacity of 200,000 inches of water, and Major McLaughlin believes there is an available force of about 5000-horse power for the generation of electricity. He talks of spending $50,000 in experimenting, and an electric road may be built into the mountain lumber camps and power be furnished to distant points.

Kern.

AMALIE DISTRICT.—A. Sauser has sold to Mr. McKnight the David mining claim for $1000. H gh Mann sold the old Tehachapi mill to Mr. McKnight, and it will be put up on the David immediately.

Mr. Mead, of Los Angeles, has bought the Brogan and commenced work. The Brogan is a free gold proposition, although the rock is not of a remarkably high grade. The lead is very large.

J. B. Ferris has bought the Caliente mine of Mr. McKay, and expects to put a crew of men to work on it immediately. Mr. Ferris also sold an interest in the Lime Kiln lead to San Francisco parties, and work will shortly be pushed on that.

J. Miller has sold a half interest in the Berry mine to some Los Angeles and Bakersfield parties, and they have men at work.

The Occidental mine has been bonded to Los Angeles and Nevada City men; consideration, $30,000.

The Amalie Co. are putting in a raise over winze No. 2 to surface, where they expect to put up a permanent hoist. They already have one hoist in operation at tunnel No. 2, winze No. 3, and are taking out large quantities of shipping and milling ore at that point. The new hoist is being put in order. They expect to continue sinking at this place, where they have already attained a depth of 250 feet.

G. E. F.

AROUND GOLER. — *Democrat:* At Mesa Springs a dozen men are at work getting gold. Summit Camp has only twelve men at work now.

Swartout, Kuffel & Harrison have a shaft fifty-two feet to bedrock and are drifting. They work five men dry-washing and take out about $100 per day.

At Red Rock S. James has leased the Bonanza Company's property. He employs sixty men running three dry-washers, and is getting considerable gold.

At Last Chance J. D. Richardson has, at 90 feet, struck an old river channel that promises to be very rich. He has two drifts, each 300 feet long. The gravel prospects from surface to bottom of shaft, but only two feet next to bedrock is being worked. About a dozen men are at work in Last Chance gulch.

Lassen.

DIAMOND MOUNTAIN.—Lassen *Mail:* Messrs. Goodwin, Shinn and Cain, who are interested in a mine at Diamond Mountain, have recently struck rock which promises well. A conservative estimate of the value of the find is $20 a ton. The mining boom in that vicinity a few years ago demonstrated beyond a doubt that a limitless quantity of gold-bearing quartz could be had, and on that occasion the cause of failure can be attributed to an absence of knowledge of reducing the ore and the incomplete milling machinery.

There is said to be an exhaustless body of ore at Diamond Mountain—several ledges have been opened which assay from $5 to $10 a ton. With modern machinery and processes for saving gold, under favorable circumstances—such as exist at Diamond Mountain, where wood and water, two essential factors, are close at hand—the actual cost of mining and milling quartz rock, if not too rebellious, does not exceed $2 a ton. If such be the case, what a bonanza awaits the enterprising individual or company who controls a quartz ledge and erects machinery for reducing it at Diamond Mountain!

Los Angeles.

AT ACTON.—R. E. Hudson has bought the old Tejunga mill and will remodel it. The Mount Miesa Company, which started its tunnel about 200 feet below the upper tunnel, have made a good strike.

Mono.

NEW CYANIDE PLANT. — *Miner:* The new cyanide plant on the Silver Hill mill site will consist of six tanks, twenty feet in diameter, with a capacity of about seventy tons each, two solution tanks and two sump tanks—ten in all. It is expected that the plant will have an average capacity of 150 tons a day. This will be the fourth and largest of the tailings plants around Bodie.

Nevada.

AFTER TWENTY YEARS.—'Tis twenty years since work was discontinued on the Bullion Consolidated group of mines—the Bullion, Ione and Galena—but the renaissance of California's mining industry includes the reopening of many mines so long idle as to be forgotten. Over a hundred thousand dollars was taken from those mines in days gone by. Geo. Mainhart, who continues as superintendent of the Omaha and Lone Jack, will oversee operations which begin this week.

SOLD FOR $25,000.—The Bryan ranch, east of Grass Valley, has been bought by the representative of an English syndicate for $25,000. It contains valuable mining ground, and is also favorably situated for reservoir sites.

A NEW PIPE LINE.—Work has begun on the new pipe line of the North Star Mining Company, which is to convey water from the South Yuba Company's ditch to Massachusetts Hill, where it will be utilized in running the large compressed air plant that the company intends establishing there and which will furnish power to drive their mining and milling machinery.

TO BE BUILT.—The plant of the North Star Company, where power will be generated for working the Massachusetts Hill claims, will be in a building 36 feet high, 108 feet long, to be erected at once.

Plumas.

THE PLUMAS IMPERIAL.—A limited amount of work recently done on the Plumas Imperial gravel mine at Hungarian Hill has so fully demonstrated the richness of the ground that the owner, Mr. Hazzard, intends thoroughly to equip the property at all points for the coming season. The old flumes are to be replaced with new ones, laid with increased grade. This will enable the same quantity of water to accomplish more than with the present low grade. The improvements contemplated by Mr. Hazzard, taken in connection with the excellent water supply, unexceptionable restraining dam and all necessary mining appliances in place on the mine, should by good management restore Hungarian Hill to the high place it held as a mining locality previous to the closing of the hydraulic mines of Plumas.

Riverside.

THE GOOD HOPE.—At the Good Hope twenty men are employed at the mine and mill. The latter is being run part of the time and enough ore is being put through to pay running expenses.

THE BRIGGS MINE.—Eight men are employed at the Briggs mine. The new shaft is down 100 feet and a nine-foot ledge has been opened up. The ore is better than any ever before found in the mine.

On the Glory mine, the second extension northwest of the Briggs, a shaft thirty-three feet deep has been sunk, and a three-foot ledge developed. Water has been struck and a pump will have to be put in.

San Bernardino.

TAILINGS TO BE WORKED.—A trial lot of 100 carloads of tailings from the mines tributary to Victor are to be brought into San Bernardino and worked. If the venture proves successful on the first hundred carloads it will result in the establishment being increased in size.

San Diego.

JULIAN AND BANNER.—*Sun:* A. P. Frary, who has been working the Hidden Treasure mine in the Julian district, brought in $7000 in Bullion, taken from 8½ tons of ore. This mine has been abandoned three or four times by different parties, but the present owners seem to have found some good rock. They are working about 200 men below the surface, and on a new chute of ore. Frary reports a big revival in mining interests in the Julian and Banner districts. The *Sun* says the records show nearly $6,000,000 in gold taken out of the Julian district alone from the beginning to the present time.

Sierra.

LARGE GOLD SHIPMENTS.—*Messenger:* Shipments of gold bullion from this part of the county have been unusually heavy during the past few weeks. Fully $25,000, taken from mines in the vicinity of Downieville, has been sent below since July 1st. The gold yield throughout the county this summer is far in excess of that of last year, and indications point to the conclusion that these favorable conditions will continue to prevail.

Siskiyou.

RENEWED ACTIVITY.—*Journal:* The Steamboat mine, at McAdams creek, is to be reopened by A. C. Brokaw and Nelson Bennett, of Tacoma, who intend constructing a bedrock drain 2¼ miles long for draining it and working the broad channel above Fort Jones. Powerful steam pumps are to be used in keeping the water out until the drain is completed, for which purpose a 75-horse power boiler, with two 12-inch pumps and hoisting machinery, will be used. The work will be commenced at the Live Yankee shaft, which will be enlarged and operated with steam hoisting apparatus. There will be three compartments and two cages, and day and night shifts will be employed constantly to keep the water out and prospect at the same time. This claim has always been noted as one of the best paying mines in Siskiyou—in fact the entire creek, all the way southward from its source, including the head tributaries of Deadwood and Cherry creeks on the divide between Yreka and Fort Jones, has yielded handsomely when worked. The only difficulty in working the lower end of McAdams creek is the great surplus of water to handle, which a bedrock drain will carry off successfully. The opening of this claim will give employment to a large number of men and put much gold in circulation, making lively times at Fort Jones and vicinity.

Tuolumne.

GENERAL NOTES.—"Argus" in *Independent:* The Mammoth, an English Co., at Jacksonville, employs about thirty men. Two tunnels are being entered from Wood's creek, and from which water has been brought a distance in ditches and flumes. A twenty-stamp mill is about to be erected. The grading out is being proceeded with.

Work is being carried out on the Eagle and Shawmut. The Homestake are working six men.

The Jumper, with a ten-stamp mill, is in full force. At the New Era the owners are developing. The Golden Rule is taking out very rich ore. They are shaft sinking with a full force of men; orushing with their ten-stamp mill. The Miller & Holmes, and a group of mines belonging to the Napa Quicksilver Co., are all in full working force. This company are putting in a full and complete electric power plant, to drive the necessary machinery for the whole group of mines owned by them.

The App, Quartz Mountain, is developed 800 feet deep, at which level, exceedingly rich ore has been struck; vein matter of large dimensions.

Next, the Dutch mine, is in active operation. They have five distinct ore bodies. This property looks remarkably well. A new five-stamp prospect mill will start up crushing this week, to determine value of ore shoots.

The Gem mine, still further north, is running their ten-stamp mill on large ore body, profitably.

The Crystalline group of mines are prospecting with a small force of men, showing value in several places, and mill of fifteen-stamps at work.

The celebrated Rawhide is taking out unusually rich ore, even for this mine, rich rock being the rule, rather than the exception. The last find is from the 700 foot level. The regular clean-ups, from this mine, are immense. This mine was abandoned, and laid idle for many years, and was purchased by Mr. Nevills, on its past record only.

In the next mine, the Rappahannock, the shaft is now down 350 feet, with excellent prospects. When the owner, Mr. Chute, crosscuts to the east, and intersects the black slate belt, another paying mine will be added to Tuolumne's list of gold producers. Last week a rich vein was discovered, on the surface, to the west, showing gold, and assaying about $30 to the ton.

At the Darrow mine, owned by Johnny Witney, very rich rock was discovered; value as high as $15 to the pound; formation, black metallic slate. He expects soon to put up a small mill. There are a number of other mines working to the north and west, including the Pena Blanco; the latter have twelve men employed, keeping mill running continuously on good rock. Large works will be placed on this property, in the near future, now being prospected by Hayward & Lane.

The Golden Gate, one mile from Sonora, is turning out its regular monthly shipment of bullion. This is a good property—needs a second shaft and increased mill and chlorination capacity; then their output would be very largely increased, with little extra cost.

IN THE COPPER BELT.—The Dead Horse, or Old Eureka, has struck a 22-foot ore body at the 1400-foot level, showing free gold in great richness, and sulphurets of high grade. This was an old abandoned mine, or rather the Eureka was, which is now an integral part of the same mine. Owners, Messrs. Hayward & Hobart estate. Their twenty-stamp mill is running day and night.

The Seminole group, all old abandoned mines, are being re-opened. The rock found is of high grade, and is turning out most profitably. Their mill is running continuously, and the shipment of bullion, monthly, is quite large. The resident manager, Col. Coles, is highly elated at his present and future prospects. This is a New York Co.

The Louisana, an old abandoned mine, is being re-timbered and pumped out. So far as unwatered, rich ore is visible, and plenty of it. The prospects for a valuable property are assured.

The Laura & North Star is sunk some 400 feet. Steam hoist; shows well. The old Eston mine is taking out rich rock. The Cullers, a parallel, shows rich ore. The North Fork is steadily working, with very good prospects.

The Old Soulsby has re-started, sinking new shaft. This mine in the early days produced millions, sunk to a depth of 800 feet. This old mine will again be a steady gold producer.

The Mountain Belle, north of Soulsby mine, will have a trial crushing next week. The ore is of high grade; rich in sulphurets; value as high as $600 per ton. Owner, O. C. Wilbur.

THE BLACK OAK.—This mine is working steadily exceedingly rich ore, six feet wide, at No. 8 level. The ore is calcined before reduced. There is a well equipped ten-stamp mill. The sulphurets are of very high grade—ten to fifteen per cent—running up into the hundreds per ton.

The Draper-Whitto, Soulsbyville, is being re-opened. This mine has a splendid record—rock paid $100 to $150 per ton, free gold; sulphurets' value, $600 per ton. Several hundred thousand dollars have been extracted in the early days.

The Belle View Mining and Agricultural Company are drifting for a shoot at their 100-foot level. This mine is well equipped and their future prospects are exceedingly good. Ten-stamp mill, steam power—same at hoist.

The Keltz mine is paying steadily. Their fifteen-stamp mill is in constant operation.

The Star group of mines, Rose creek, is being systematically developed. They find some high grade ore on the shoots that have been exposed; value in the hundreds per ton.

The Chimney mine and extension has just started up. The ore runs as high as $300 and $500 to the ton in free gold. The vein is four feet wide. A new tunnel is being entered; 100 feet of length will give 200 feet of backs, which increases in greater proportion as entered.

The Ham & Birney, on the Stanislaus river, is well opened by four or five tunnels. They keep a ten-stamp mill profitably employed on their rock. There are many other mines working with a small force of men in this district.

Yuba.

WILL DREDGE THE GRAVEL.—The New Era Gravel Mining Company is a new corporation formed here to work an old gravel claim at Long Bar by means of a dredger, lifting the gravel from under the water and thus obviating the necessity of pumping.

NEVADA.

ON THE COMSTOCK.—*Tribune:* The ore extracted by leading Comstock companies is holding out well in value. The averages of the Con. Cal. & Virginia are $50.61 a ton. On the 1650-level they seem to be getting into a new body of ore. They find quartz at this point that assays from $8 to $10 a ton, with room ahead for a large bonanza.

At the old Ophir they have found in a porphyry formation some small streaks of ore that assay $20 a ton. These streaks are liable to lead to a large deposit of ore. The Chollar ore now being worked averages $41.12 a ton. In the Potosi they have recently found a six-foot streak of ore on the 450-level that assays from $25 to $45 a ton. In the Savage they have a new streak of ore that averages $73.13 a ton. The ore extracted at the Belcher averages $12.17, and that from the Seg. Belcher $26.53. The Crown Point is yielding gold quartz that assays from $8 to $11 a ton. They mill a little over 600 tons a week. The June run amounted to $22,182.61.

In other leading mines prospecting is active, with more or less promising material in sight. The Occidental and one or two other companies that have pay ore in sight are not at present extracting ore.

LYON COUNTY.

BONDED BY BRITONS.—*Enterprise:* Albert H. Furness of London, representing a large syndicate of English capitalists, has bonded a group of mines in Como, the Mount Como, the Palmyra and three other contiguous claims, for $400,000. Papers were signed in Dayton last week, and together with reports on the properties involved were sent to England.

There is a great flow of water in all the Como mines, which precludes any great development until such a time as a drain tunnel shall be constructed. Colonel Boyle has perfected all preliminary arrangements for the construction of such a tunnel, and active work will be commenced upon it on the 10th of next month.

The Logan mines, Colonel Boyle's properties and the claims bonded will be drained by this tunnel, which will be a lengthy one and which will entail great outlay.

BRITISH COLUMBIA.

A STAMPEDE.—D. C. Clark, owner of half a dozen mines in the Trail Creek district, brings news to Spokane of a stampede from Rossland and other points to a new district twenty miles from Trail creek, at the head of Murphy creek. Two prospectors from that almost inaccessible region brought with them some samples of surface rock, which, when assayed, went $163 in gold. The news of the find spread like wild fire, and soon hundreds were on their way to the promised El Dorado.

TWO LIVELY CAMPS.—G. W. Paine returned from the northern mining camps, including Rossland, Nelson, Ainsworth, Kaslo and Pilot Bay, and says: "There are only three mines in the Rossland district, the Le Roi, War Eagle and Josie, hut there are many prospects. Everything with an iron capping in the district has been located. There have been 2500 claims located. Each embraces 52 acres, which means that the ground located covers a territory of 150 square miles. Mr. Humphreys has been bonding claims right and left, and at prices ranging from $25,000 to $60,000. Rossland is growing at a wonderful rate; it is five times as big now as it was last March." Of the Blue Bell mine and smelter on Pilot bay he says: "The Blue Bell is one of the greatest lead mines in the world. The ore is being run through the smelter at the rate of 200 tons a day, and there is ore enough in sight to keep the smelter running at that rate 25 years. The ore is exceedingly low grade, only going 8 or 10 ounces in silver, the rest being pure lead. The Skylark and No. 1 mines at Ainsworth are shipping their ore to the smelter. The smelter uses 60 cords of wood and 100 tons of coke a day. There are 60 men employed at the smelter and 50 in the mine, and about 60 are employed cutting wood. The duty on the product of the smelter, which is shipped to the refinery at Aurora, Ill., amounts to about $400 a day. Manager Hendryx told me if the mine was on this side of the international boundary line it would increase the profits $500 a day. Fortunately, the expense of mining is small. Incredible as it may seem, the ore is mined and laid down at the smelter at a cost of 41 cents a ton."

COLORADO.

FILTERING FOR GOLD.—At the Phillip "B" mine in West Colorado Springs, the plant installed consists of a 15-horse power boiler, a steam hoister and 200 feet of cable and bucket, a 125 gallon per minute steam pump and a large battery of filters charged with the Pearce formula for collecting gold and platinum from their aqueous solutions. The flow of water is strong from the north by northwest. The values in this gold mine are found both in the water in solution and fine, very fine gold in the sand, a large per cent of which is black sand. The pump's capacity is sufficient to increase the filtering capacity to about 100 barrels.

THE NEWHOUSE TUNNEL.—The work in the Mewhouse tunnel at Idaho Springs creates a comparatively clean bore of 12x12 feet. For years past some project of the kind has been considered; Samuel Newhouse of Denver bought the Idaho Springs end of Seaton mountain and commenced to bore straight for Central City. Two air compressor plants are used. Two drills are kept going the entire twenty-four hours, with brief intervals for blasting and dumping. The tunnel is now in 3,000 feet, and when completed will be four and one-half miles in length. The dip is towards Idaho Springs and is about five inches in 100 feet.

Work has also been started on the Central City end of the tunnel, four and one-half miles from its mouth at Idaho Springs, on the Eureka mine, where a shaft is now down about 500 feet and will be continued to a depth of 1,800 feet.

VERY RICH POCKET. — A Victor dispatch says: W. S. Stratton has struck what is probably the richest lode ever found in any mine in that country. On the Independence the miners, in following a lead, "ran across a vein of sylvanite that will run $140,000 to the

ton." It was at a point where both veins came together, and statement is made that "there is not less than several millions of the ore in sight."

IDAHO.

THE COEUR D'ALENES.—About 100 men are employed at the Standard mine. The lower tunnel is in 100 feet.

The ore is taken to the Union mill to the amount of 200 tons daily and concentrated. In addition to this some first-class ore is shipped without treatment other than sorting.

The Gem mine is running to its full capacity, employing about 100 men. The mill is running on two shifts.

ALONG YANK RIVER.—The Yuhk river mining camp is not in Montana, as has been supposed, but in Idaho. The Yuhk river at that point is the dividing line between the two States, and the mines are on the Idaho side.

The nearest railroad point is Leona station, about midway between Bonner's Ferry, Idaho, and Troy, Mont., on the Great Northern. The mines are eighteen miles from Leona, almost due north.

The Capital claim was the first located, and on this most of the work has been done: assays have been showing well. The ore is free milling. There are about 150 men in the camp.

RICH IDAHO GRAVEL.—*Tribune:* Colonel A. J. Bowie has mining properties located near Leesburg. His past year's experience upon a gold bar near Leesburg has demonstrated its value. He has, in proving up the values of the gravel, taken out $30,000, and in doing so has worked only on a limited flow of water. What is needed, he says, is an increased supply, and when that shall have been acquired, the property, he feels sure, will become one of the most productive in the West.

MONTANA.

THE ANACONDA SMELTER.—*Review:* In the new building, within the last six weeks, more than 2,000,000 brick have been laid. Four matte furnaces will soon be ready to fire up. There will be fourteen of these matte furnaces in the building. At present twenty calciners are in operation in No. 1 smelter. The calciners are taken to matte furnaces at the lower works. The new matte furnaces are connected with the old flue of No. 2 smelter. This has been bulkheaded at the south end and is now connected on the north end with the high stack which carries off the smoke from the copper smelter. The new flue carries off the smoke from No. 1 smelter, which contains forty calcine furnaces. The new automatic copper dipper at the copper smelter is not yet in successful operation. At the new refinery building, carpenters are engaged in building the tank foundations. The lead lining for the vats has arrived. This required a train of cars to haul it. Opposite this building six boilers are being placed in position to supply power to operate the electric dynamos furnishing the current for the refinery.

WILL BUILD A DITCH.—The Eureka Mining Company is preparing to commence the work of putting in a ditch at an estimated cost of $9000. Hiram W. Rogers is secretary and treasurer. The ground owned by the company is located in Quartz gulch, a tributary of Rock creek, about fifteen miles from Philipsburg. The company proposes to put in a ditch that will carry 600 inches of water.

A NEW ORGANIZATION.—*Inter-Mountain:* The Queen Mining and Milling Company has been organized in Great Falls, with Harry Hill secretary and treasurer. It is built upon what is left of the Queen of the Hills Mining Company, and provides for the issuance of 300,000 shares at $10 each. The company extends an offer to the individual stockholders of the original Queen of the Hills Mining Company to enter the new company by purchasing shares at the rate of 28 cents.

OREGON.

AT CORNUCOPIA.—The Union-Companion Mining Company at Cornucopia has contracted with the I. B. Hammond Company, of Portland, for a twenty-stamp mill.

CANYON CREEK PLACER MINES.—The placer mines of Canyon creek, Marysville and Prairie diggings have produced over one-half of the gold taken out of the different placers in the county, or over $2,500,000. Canyon creek is credited with $2,000,000 as its output. Over 4000 men were employed in 1894 on the creek. With the exception of the Humboldt mine, no hydraulic mining has been done. The work consisted of stripping off the ground to within two feet of the bedrock. The remaining gravel was wheeled into sluice-hoxes and washed. Wages were $3 per day, and nothing but the richest parts of the creek worked. The east side of the creek, below Canyon City, was not considered rich enough, and has not been worked. The dirt stripped off varied in depth from eight to sixteen feet, all of which prospects well. It is claimed by all of the old-timers yet residing in the county that not one-half of the gold has been taken out of the creek.

SOLD TO MICHIGAN MEN.—W. Q. Brown has closed a deal with George E. Nichols, representing Grand Rapids, Mich., men, whereby 320 acres of mining claims have been transferred. The property comprises the claims of W. H. Gordon, J. L. Scott, W. Huggins, N. Sehring and W. Q. Brown. The company was organized at Grand Rapids, Mich., with a capital of $2,500,000. Secretary, G. E. Nichols; T. L. McGarry, W. H. Woods, G. E. Nichols, C. E. Brown and W. W. Thompson, directors.

ON THE SANTIAM.—In the Quartzville mines forty men are employed, tunneling, laying track for new cars, and making ready for machinery. The wagon road from Gates, on the Oregon Eastern and Central road, into the mines, has been graded. It is eighteen miles long; the mining company has expended $2500 putting it in repair.

Superintendent W. B. Lawler, having some capital himself, has induced capital to believe there is a field for investment in these mines, and has enlisted sufficient to make a test. The company's engineer, Arthur L. Pierce, sailed for London from New York on the 20th ult. When the kind of machinery is decided upon by the members of the syndicate in London, Engineer Pierce will cable specifications immediately to Mr. Lawler, so that excavations may be made in accordance therewith. The machinery will cost $25,000. The outlay necessary to put the mill in position, ready for operation, and the expense in getting ore ready to be crushed will approximate $100,000. Mr. Lawler states that a 20-stamp mill will be dropping at the Quartzville mines by the 1st of January.

MAID OF ERIN SOLD.—The Maid of Erin mine, owned by P. Long, was sold in Baker City last Tuesday for $10,000, mostly spot cash, to A. Dragovich of this city and J. Conlisk and H. C. Baker of Ogden, Utah. The mine is on the Union county side of Powder, on the Baker City-Seven Devils road.

SOUTH DAKOTA.

KEYSTONE.—*Pioneer:* The Holy Terror Company is sinking the original shaft, which is 65 feet below the 85-foot level. They expect to go down 300 feet. The mill is shut down at present.

Work is being pushed on the Keystone shaft and will be kept up until a 400-foot level is reached. There are fifteen stamps at work.

WASHINGTON.

MINING DEAL NEAR LEAVENWORTH.—John Stanshury, representing the Tacoma Smelting Company, has bonded several claims on Pike creek owned by Hood and Grant of Leavenworth.

Pike creek is a small stream joining the Peshastin river three miles above the mouth of Ingalls creek. The formation all along the stream indicates gold and several claims have been located a long time. It is near the old Blinn stamp mill, now owned by the Cascade Mining Company, which was a liberal producer of gold 15 years ago.

Mr. Stanshury is also examining some nickel properties on Red Butte mountain, Ingalls creek.

G. A. Weber has been relieved as superintendent of the Ontario mine, and other changes are expected to be announced in the near future.

WYOMING.

NEAR HAHN'S PEAK.—Twenty men a day are going into the Columbine camp, near Hahn's peak. Appearances indicate a permanent camp. Much of the mortaring and panning show free gold. The rock is of a carboniferous nature, and resembles the Leadville carbonate. A number of the prospectors are from Aspen, Colorado, and are working in the interests of David Brown. Red Park, north of the peak, has a camp of twenty-five men and Columbine 200 men.

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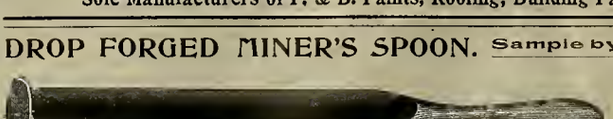
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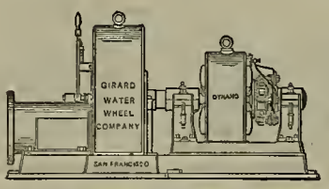
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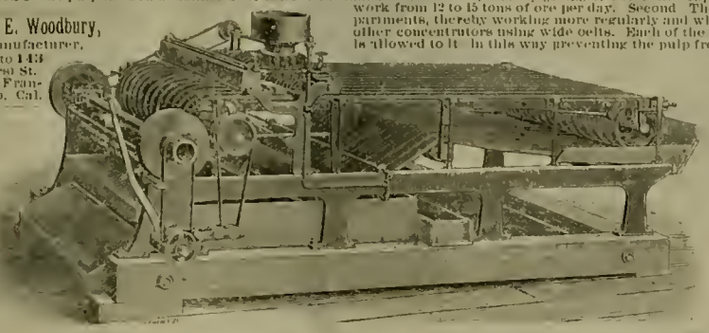
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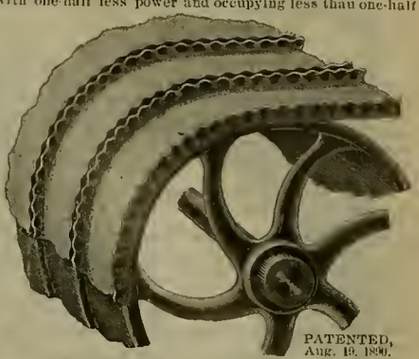
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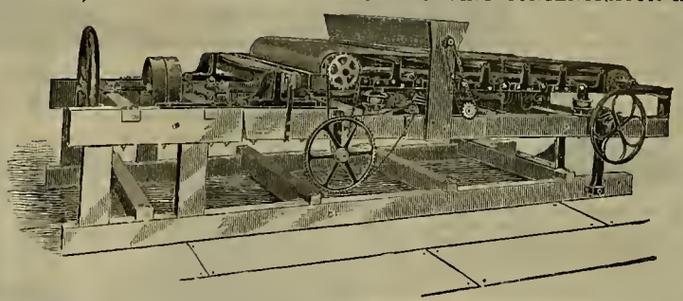
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Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1895.
THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show " " " from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, " " " a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works.

The Edward P. Allis Company, Milwaukee, Wis.

Established 1860. Reliance Works.

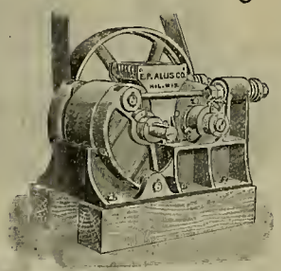
MINING, MILLING AND SMELTING MACHINERY.

Crushers, Rolls, Jigs, Concentrators,
Screens, Stamps, Pumps,
Compressors, Hoists, Boilers, Etc., Etc.

Reynolds Corliss Engines.

WORK THE BEST, PRICES THE LOWEST.

The Reliance Crushing Rolls.



The Best in the World.

BRANCH OFFICES:

San Francisco, Cal.	9 Fremont Street.
Butte, Mont.	30 W. Granite Street.
Salt Lake City, Utah.	73 So. Main Street.
Denver, Col.	427 Seventeenth Street.
Minneapolis, Minn.	416 Corn Exchange.
Chicago, Ill.	509 Home Ins. Building.
Kansas City, Mo.	43 Armour Building.
Pittsburgh, Pa.	German National Bank Building.
New York City	26 Cortlandt Street.
City of Mexico	Calle Gante, No. 12.

WRITE FOR OUR NEW CATALOGUE.

THE AMERICAN MINING & MILLING MACHINERY CO.,

121 Euclid Ave., CLEVELAND, O. 280 Caxton Blk., CHICAGO, ILL.

SPECIALTIES:
AM. CRUSHER AND AM. BALL PULVERIZER.

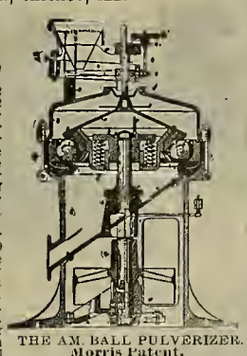
The simplest, cheapest and best machines in the market. Pulverize wet or dry to any degree of fineness. Make little or no slimes in wet nor dust in dry work. Four sizes, capacity from 2 to 60 tons per day.

SEND FOR CATALOGUE.
Cable Address, American.
First Prize and Gold Medal Awarded by World's Fair, 1893.

Office of THE CLEVELAND IRON ORE PAINT CO. and THE GARRY IRON ROOFING CO., CLEVELAND, O., Jan. 25, 1894.

The American Mining & Milling Machinery Co., Cleveland, O.:

GENTLEMEN:—We purchased a No. 2 American Rock Breaker and a No. 2 American Ball Pulverizer from your company about one year ago. The latter part of April, 1893, we started up for regular work, since which time we have run both of said machines to the full extent of our demands and to our entire satisfaction. The first 700 tons of hard iron ore that we pulverized for paint purposes was ground without taking the Pulverizer apart, and without expending one dollar for repairs for either of these machines. Of the 700 tons spoken of, about 200 tons was Lake Superior Specular iron ore, containing some 70 per cent iron; a very difficult ore to pulverize. The remainder was a red fossiliferous iron ore, carrying quite a per cent of silex, which cuts out buhr-stones rapidly. We find that the steel balls, which were when new 5 in. in diameter, now caliper 4⅞ in., and are perfectly round and smooth. The grinding track shows very little wear, and the driving truck shows less; in fact, the wear is almost imperceptible. These two machines crush and pulverize more than one ton per hour with less than 12 H. P. We do not know of any Crusher or Pulverizer that can compare with the output of these two machines in quantity, quality, small amount of wear and tear, and like power. In our opinion, you cannot recommend them too highly. Very truly yours,
CLEVELAND IRON ORE PAINT CO.



THE AM. BALL PULVERIZER. Morris Patent.

THE OLD RELIABLE!



ALBANY
LUBRICATING COMPOUND

TWENTY-SEVEN YEARS' CONTINUOUS SERVICE in the great Mines, Steamships, Railroads and Mills all over the world prove it to be

THE KING OF LUBRICANTS!

Tatum & Bowen

34-36 FREMONT ST., SAN FRANCISCO.
85 FRONT ST., PORTLAND, OR.

DEALERS IN MACHINERY, OILS, MINING AND MILL SUPPLIES, ETC.

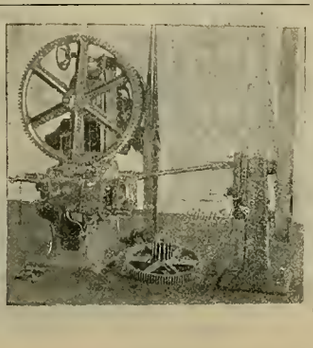
GEAR CUTTING
A SPECIALTY.

Fine Work at Bedrock Rates.

SPUR, BEVEL, and WORM GEARS of any pitch or size up to 50 Inches.

‹‹‹‹ TAPS AND REAMERS GROUND. ››››
Experimental Machinery and Repair Work of all kinds.

P. T. TAYLOR & CO.,
523 Mission Street, - - San Francisco Cal.



Thomas Price & Son,

Assay Office, Sampling Works

And Chemical Laboratory.

524 Sacramento Street, San Francisco, Cal.

Market Reports.

The Markets.

SAN FRANCISCO, Aug. 1, 1895.

The advance in metals continues. During the week the Wire Nail Manufacturers' Association have advanced the price of nails 50 cents per keg. The advance is said to be the result of the Consolidated Wire Nail Company getting control of almost the entire product of the country.

Copper continues firm, as also iron and steel. A dispatch received from Pittsburg this afternoon says:

Reports dealing with the condition of the iron trade show some irregularity. On the whole, however, the industry is holding its own remarkably well. Bessemer pig iron has been quiet since the recent large transactions which have taken out of the market two of the large Shenango Valley furnaces for a considerable period.

In the East a number of small lots have been picked up, but on the whole the shortage remains. Steel billets weakened a little early in the week under review, largely because of the labor troubles at the wire rod mills. The numerous inquiries appeared in the market and the old range of prices was recovered. The mills in the Chicago district are crowded with work. The strongest article in the whole list of finished goods is plates, which are extremely scarce.

Car building has been more active lately and has found its expression in heavy demand for bars. The Western Association has again made an advance, this time of $2 per ton, and the western markets have followed suit with a rise of 1 1-10c per pound.

There has been some easing up in the pig iron markets lately. Cincinnati reports indicate that in the West this feeling has been only temporary. In the East cutting has been confined chiefly to mill iron. Copper has stiffened further for the consumption, showing good increase.

New York Metal Market.

NEW YORK, Aug. 1.—PIG IRON—Scotch, 19@20c; American, 13@15c.

COPPER — Brokers', 11.10 @ 11.20c; exchange, 11.65@11.75c.

LEAD—Brokers', $3.37½; exchange, $3.55.

TIN—Straits, 14.60@14.65c.

SPELTER—Domestic, $3.80.

New York Silver Prices.

NEW YORK, Aug. 1.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.
Friday	30¼	66½	11 10	.....
Saturday	30¼	66½	11 20	3 25
Monday	30⅛	66	.....	3 30
Tuesday	30¼	66⅛	.....	.....
Wednesday	30⅛	66	11 25	3 25
Thursday	30¼	66⅛	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.89¼
London Merchants	$4.87½
London Sight Bankers	$4.90¼
Refined Silver, per ounce	66½c
Mexican Dollars, nominal	54c

San Francisco Metal Market.

COPPER.

Bolt	¼ & 5-16, 17c; ⅜ and larger,		17c
Lake Superior Sheathing	19	@	—
Ingot, jobbing	—	@	15
Ingot, wholesale	14	@	13
Sheet copper	—	@	18

ZINC.

Sheet	9	@	

LEAD.

Pig	—	@	4 00
Bar	—	@	4 10
Sheet	—	@	5 35
Pipe	—	@	4 85

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes,	"	"	1 45
Buck, Balls and Chilled, do.	"	"	1 45

IRON.

American Soft	15 00	@	17 00
Pig, per ton	16 00	@	19 00

STEEL.

English, lh	15	@	17

ANTIMONY.

Per lb	—	@	10

COKE.

Gas Companies'	75c ₱ bbl		
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —

PIG TIN.

Per lb	15	@	16 00

QUICKSILVER.

Home trade, per flask	41 00	@	— —

TIN PLATE.

Per bx	5 25	@	6 00

BORAX.

Refined, in car lots	—	@	5½
Refined, in sacks and barrels	—	@	5⅝
Powdered, in car lots	—	@	5⅝
Concentrated, "	—	@	4⅞

ZINC.

Sheet	8¼	@	

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00
Greta	7 00
Nanaimo	6 50
Gilman	6 00
Seattle	6 50
Coos Bay	5 00
Cannel	8 00
Egg, hard	12 50
Wallsend	7 00
Scotch Splint	7 50
Brymbo	7 50

TO ARRIVE—CARGO LOTS.

Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

NAILS.

Wire	$2 30
Cut	2 00

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Belcher S M Co., Nev	51	25c	July 16, Aug 20, Sept 10	C L Perkins, Mills Building
Best & Belcher M Co, Nev	58	25c	June 12, July 18, Aug 10	M Jaffe, 309 Montgomery
Bullion M Co, Nev	45	10c	June 12, July 17, Aug 7	R R Grayson, 331 Pine
Challenge Con M Co, Nev	19	5c	June 11, July 16, Aug 6	C L McCoy, Mills Building, City
Gold Bar Cons M Co., Cal	1	2c	May 24, Jun 29, Aug 21	E C Godfrey, Crocker Building
Gould & Curry, Nev	76	15c	July 2, Aug 6, Aug 28	A K Durbrow, 309 Montgomery
Mono M Co, Cal	35	10c	July 16, Aug 15, Sept 10	M E Willis, 309 Montgomery
Occidental Con M Co; Nev	19	10c	June 25, July 30, Aug 21	A K Durbrow, 309 Montgomery
Ophir S M Co, Nev	66	25c	July 11, Aug 13, Sept 2	E B Holmes, 309 Montgomery
Potosi M Co, Nev	44	25c	July 14, Aug 14, Sept 4	C E Elliott, 309 Montgomery
Sierra Nevada S M Co, Nev	109	25c	July 30, Aug 30, Sept 23	E L Parker, 309 Montgomery
Union Con	51	20c	June 18, July 19, Aug 15	A P Swain, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Alta S M Co, Nev	J E Jacobus, 309 Montgomery	Aug 15
Navajo M Co, Cal	J W Pew, 310 Pine	Aug 13

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, August 1, 1895.

There were a few sales during the week at prices that varied a few cents. The only sensation was the announcement by a prominent Con. Va. stockholder that he would bring suit in the U. S. Court of Nevada against Supt. Lyman to compel that official to furnish an accounting. The Hale & Norcross decision still slumbers in the Supreme Court. The mining companies' dividendsin July '94 were $107,350; in July '95 they aggregated $156,250, being as follows: Alaska-Mexican Mining Co., 15c ₱ share, $30,000; Alaska-Treadwell Mining Co., 37½c ₱ share, $75,000; Homestake Mining Co., 25c ₱ share, $31,250; Napa Con. Quicksilver Mining Co., 20c ₱ share, $20,000.

Senator Jones of Nevada is in the city. Jno. W. Mackay is expected here about the 15th inst.

At the annual meeting of the stockholders of the Lady Washington Mining Company Jno. Landers was elected president, H. Zadig vice-president, and Messrs. Goodrich, McBoyle and Stauf, directors. J. E. Jacobus was re-elected secretary, and E. D. Boyle superintendent.

The following illustrates the changes of the week:

Mines.	25	1
Alpha	.....	$ 08
Alta Consolidated	.....	10
Andes	.....	26
Belcher	$ 31	26
Best & Belcher	87	89
Bodie	.....	14
Bullion	.....	16
Challenge	.....	27
Chollar	55	.....
Confidence	.....	80
Consolidated California and Virginia	2 70	2 60
Consolidated New York	.....	.....
Crown Point	37	38
Exchequer	.....	.....
Gould & Curry	36	35
Hale & Norcross	1 40	1 55
Justice	.....	.....
Mexican	67	64
Ophir	1 30	1 25
Overman	.....	.....
Potosi	35	32
Savage	36	37
Sierra Nevada	45	42
Union	44	.....
Utah	03	.....
Yellow Jacket	37	31

San Francisco Stock Board Sales.

SAN FRANCISCO, August 1, 1895.

9:30 A. M. SESSION.

100 Alta	10	100 Occidental	30
100 Andes	26	100 Ophir	1 25
300 Belcher	26	100 Potosi	31
200 Best & Belcher	83	50	32
100 Crown Point	35	100 Savage	34
700 Gould & Curry	33	100	35
200 Hale & Norcross	1 45	100 Sierra Nevada	39
200 Mexican	62	200 Yellow Jacket	31

SECOND SESSION—2:30 P. M.

300 Alta	10	100 Crown Point	38
100 Alpha	08	600 Gould & Curry	35
350 Andes	26	800	34
150 Belcher	26	450 H & N	1 55
500 Best & Belcher	89	250 Mexican	64
400 Bodie	14	100 Potosi	32
150 Bullion	16	300 Savage	37
150 Challenge	27	100 Sierra Nevada	42
20 Confidence	80	50	43
300 Con Cal & Va	2 60	500 Yellow Jacket	31

Gold Quartz Mine

FOR SALE AT A BARGAIN.

Eight Quartz Claims, with 10-stamp mill, complete. Income paying and now in operation. For $90,000, easy payments. Worth $250,000. A "snap" if sold within three weeks; after that time $200,000 will be the price. I want to find a mine purchaser who means business at once.

Four-foot vein ore $20 to $40 per ton.

J. F. CROSETT, 628 Sacramento St.

WANTED!

A COMPETENT MILL MAN,

Who understands Vanner Concentration and plate amalgamation, as assistant in a 50-ton concentrating plant in northern Mexico. Salary $125 U. S. Currency per month. Must be thoroughly sober and well recommended. A married man preferred. Address B. D., care this office.

WANTED.

A thorough miner, bookkeeper, assayer and millman desires position. Several years experience in California and Nevada mines as superintendent and foreman. Good references. Address J. S., 1133 Market St., Stockton, Cal.

DELINQUENT SALE NOTICE.

GOLD BAR CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 24th day of May, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
John E. Todd	5	2,500	$ 50 00
John E. Todd	6	2,500	50 00
John E. Todd	9	2,500	50 00
John E. Todd	55	2,500	50 00
Jas. P. McCarthy	13	625	12 50
Jas. P. McCarthy	63	2,500	50 00
Jas. P. McCarthy	64	2,500	50 00
Jas. P. McCarthy	65	2,500	50 00
Jas. P. McCarthy	66	2,500	50 00
W. A. H. Connors	14	625	12 50
W. A. H. Connors	52	1,800	36 00
John H. Page, Trustee	22	500	10 00
John H. Page, Trustee	23	500	10 00
John H. Page, Trustee	84	9,000	180 00
C. A. Moore, Trustee	28	5	10 00
C. A. Moore, Trustee	29	4,995	99 90
C. A. Moore, Trustee	32	16,666	333 32
I. N. Pattison	53	1,000	20 00
J. S. Herron	41	300	6 00
E. C. Godfrey, Trustee	74	6,000	120 00
E. C. Godfrey, Trustee	57	1,000	20 00
E. C. Godfrey, Trustee	58	500	10 00
E. C. Godfrey, Trustee	59	500	10 00
E. C. Godfrey, Trustee	60	200	4 00
E. C. Godfrey, Trustee	85	2,500	50 00
E. C. Godfrey, Trustee	86	4,000	80 00
Louise V. Rugg	36	10,000	200 00
A. U. Rugg	33	16,667	333 34

And in accordance with law, and an order from the Board of Directors, made on the 24th day of May, 1895, so many shares of each parcel of such Stock as may be necessary will be sold at public auction at the office of the Company, Room 38, Crocker Building, corner Montgomery and Market streets, San Francisco, California, on Monday, the 22nd day of July, 1895, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

E. C. GODFREY, Secretary.

Office—38 Crocker Building, San Francisco, California.

POSTPONEMENT.

By a resolution of the Board of Directors of the Gold Bar Consolidated Mining Company the day of sale of the above delinquent stock has been postponed to WEDNESDAY, August the 21st, 1895, at the same place and at the hour of 2 P. M.

E. C. GODFREY, Secretary.

Office—Room 38 Crocker Building, San Francisco, California.

WANTED SITUATION AS BOOKKEEPER and Assayer in mine. A 1 references. Communications confidential.

Address X. Y. Z., This Office.

Assessment Notices.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 25th day of June, 1895, an assessment (No. 19) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of July, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 21st day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

GOULD AND CURRY SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Trustees, held on the second (2d) day of July, 1895, an assessment (No. 76) of Fifteen (15c) Cents per share was levied upon the Capital Stock of the Corporation, payable immediately in United States Gold Coin to the Secretary, at the office of the Company, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the Sixth (6th) day of August, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the Twenty-eighth (28th) day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California; location of works, Inyo, Inyo County, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the 5th day of July, 1895, an assessment (No. 27) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 12, rotunda, Mills Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 8th day of August, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 4th day of September, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

W. W. SARGEANT, Secretary.

Office—Room 12, rotunda, Mills Building, San Francisco, California.

UNION IRON WORKS,

SACRAMENTO, ... CALIFORNIA.

ROOT, NEILSON & CO.,

—MANUFACTURERS OF—

STEAM ENGINES, BOILERS,

And all kinds of

✦ ✦ MACHINERY FOR MINING PURPOSES.

Flour Mills, Saw Mills and Quartz Mills; Machinery Constructed, Fitted Up and Repaired.

FRONT STREET, Bet. N & O

SACRAMENTO, CAL.

Stamp Mills!

VULCAN WIRE ROPEWAY

For Conveying Ore, Cordwood, Etc.



SNYDER MINE, KENNETT, CAL. In reply to inquiry as to how Tramway is doing, am prepared to state that it has given ENTIRE SATISFACTION IN EVERY PARTICULAR.

JUDKINS TRAMWAY CO., POMEROY, WASH.

It will give us great pleasure to recommend your Ropeway and your Company as well to any persons who may be thinking of erecting Ropeways.

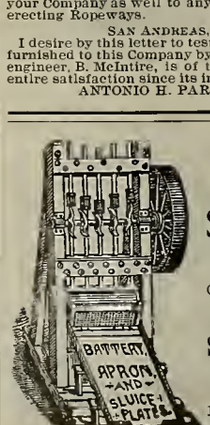
SAN ANDREAS, DURANGO, MEXICO, March. 20, 1894.

I desire by this letter to testify that the Vulcan Wire Ropeway furnished to this Company by your Works, and erected by your engineer, B. McIntire, is of the very best class, and has given us entire satisfaction since its installation.

ANTONIO H. PAREDES, Director S. A. de la S. M. Co.

Vulcan Iron Works,

135-145 Fremont St., San Francisco.



To Gold Miners!

Silver Plated Copper Amalgam Plates

For Saving Gold.

GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

SAN FRANCISCO GOLD, SILVER AND NICKEL PLATING WORKS,

653 and 655 Mission Street, San Francisco, Cal.

. . . Telephone. Main 5931.

E. G. DENNISTON, - - - - - - - - - - - - Proprietor

Every description of work plated. Send for Circular.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 23, 1895.

543,120.—ENVELOPE—J. Bacher, Santa Moulca, Cal.
543,169.—SELF-MEASURING TANK—C. M. Bridges, Seattle, Wash.
543,306.—GOPHER TRAP—A. Butzer, Deer Park, Wash.
543,228.—NOZZLE REGULATOR—A. Chavndne Grass Valley, Cal.
543,175.—CAN LABELING MACHINE—D. Cox, Sacramento, Cal.
543,128.—GLOBE VALVE—W. Curlett, S. F.
543,440.—STAMP ATTACHER—T. C. Devlin, Portland, Or.
543,441.—STAMP ATTACHER—T. C. Devlin, Portland, Or.
543,208.—TREE PROP—B. E. Douglass, Riverside, Cal.
543,422.—VOTING BOOTH—J. W. Ernest, Los Angeles, Cal.
543,095.—LUNCH CAN—W. E. Howell, Los Angeles, Cal.
543,283.—MEASURING DEVICE—H. Kantorovitz, Walla Walla, Wash.
543,157.—EXPLOSIVE ENGINE—M. L. Mery, Chico, Cal.
543,137.—WAVE MOTOR—J. A. Moore, Lancaster, Cal.
543,198.—GUN STOCK—A. J. Murray, Unity, Or.
543,159.—CAN FILLER—R. F. Schroeder, Sacramento, Cal.
543,160.—TELEPHONE EXCHANGE—W. Y. Shibata, S. F.
543,059.—AXLE SETTER—J. F. Schultz, San Jacinto, Cal.
543,062.—GLOVE FASTENING—Thompson & Zuver, S. F.
543,116.—IGNITER—G. W. Waltenbaugh, S. F.
543,225.—TRACK CONNECTION—J. W. Wiseheart, Sacramento, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CRUSHING AND GRINDING MILL.—H. L. Lightner, San Francisco, Cal., and J. J. Newsom, Oakland, Cal., assignors to H. L. Lightner, H. C. Biggs and O. C. Haslett of San Francisco, Cal., and Jessie L. Newsom of Oakland, Cal. No. 542,087. Dated July 2, 1895. This invention relates to that class of mills for breaking up and reducing rock, ore and other materials and in which a muller, operating within a mortar, has imparted to it a wabbling motion over a fixed die in the mortar and about a central cone therein by means of a crank pin applied to it. The mill consists of a mortar having a central cone, a hollow shell forming a cylindrical or conoidal muller, a non-gyratory shaft passing up through the central cone of the mortar and having a crank pin fitted thereto just below the top of the muller and passing loosely through the same, and means for rotating the shaft. It also consists in other details relating to the construction of the mortar, the hopper and the means by which the mill is kept lubricated. The object of the invention is to increase the efficiency of a mill of this general character, not only with respect to its grinding or pulverizing action, but also to adapt it, by reason of the strength, shape and weight of its parts, and especially of its muller, the hopper and position of the driving shaft crank, to the crushing of rock.

COIN RECEPTACLE AND REGISTER.—Arthur W. Coffin, S. F. No. 542,796. Dated July 16th, 1895. This invention relates to a device for receiving and holding coins, and registering the number or amount of the various coins thus received. It consists of an interior case, having a dial with subdivisions and figures indicating amounts, a hand or pointer centrally pivoted and movable over said dial, interior mechanism by which the pointer is advanced in one direction by the introduction of a coin and proportionately to its diameter, slots in the periphery of the case for the introduction of the coins, and a mechanism intermediate between the pointers and an arm which is movable by the introduction of a coin, whereby the pointer will be advanced over the dial to indicate the amount of the coin thus introduced.

ASH AND SOOT PAN.—Herman Colman, San Francisco, assignor of one-half to Julius Colman, of Oakland. No. 542,797. Dated July 16, 1895. This invention relates to a combined ash and soot pan, to be used in conjunction with stoves and ranges. The object is to so construct the pan which receives ashes from the grate that any deposits of soot from beneath the oven may be raked directly into the pan and removed, without the necessity of removing the pan and drawing these deposits into the space usually occupied by the pan, and afterwards removing them with a shovel. It consists of a pan adapted to fit the ash pit beneath the grate of a stove or range, and having an open rear side and vertical guides, within which a sliding gate or door is adapted to move, so that for ordinary purposes the pan is closed upon all sides, but when the deposit is to be removed from beneath the oven this grate may be withdrawn, leaving the rear portion of the pan open toward the space beneath the oven.

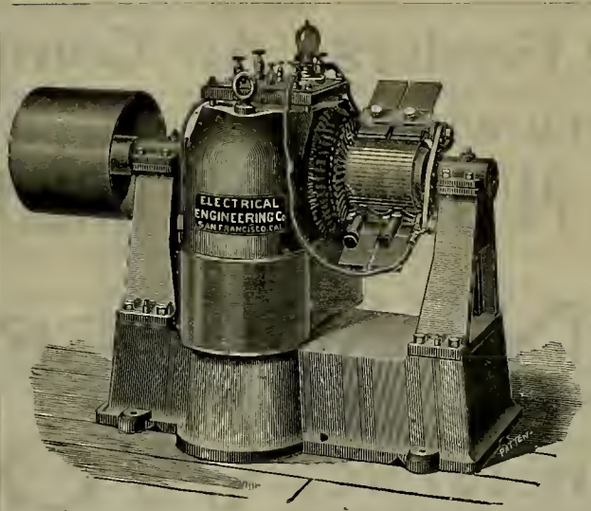
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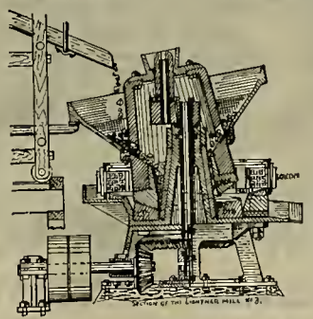
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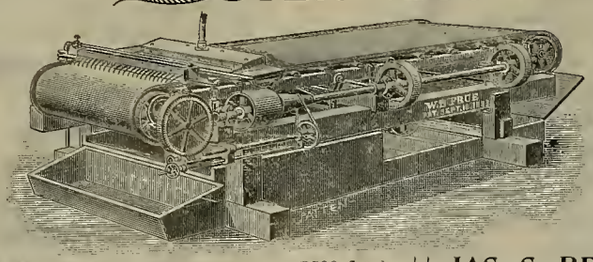
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Cheap Ocean Transportation.

There arrived here on the 1st inst. a raft of logs from the Columbia river, the first shipment of the kind on this coast, and a noteworthy event in the history of cheap ocean transportation. From the days of the old Sylvia de Grace, when freight on lumber from the Columbia river to San Francisco was $100 per M ft., board measure, to the present, the cost of lumber in San Francisco has been a varying problem. For the last ten years freight has been from $3 50 to $5.00 per M., by sailing vessel from Puget sound and the Columbia river, where is found the finest spruce and fir. The success of the present enterprise means considerable to California in the matter of cheap lumber. The idea of rafting logs down the coast from Oregon and Washington to California ports has long been entertained. Several attempts have been made, all resulting disastrously, the rafts going to pieces amid the ocean waves and forming a serious menace to coast vessels, sail and steam. The effort has at last been successfully carried through, and a brief account of the scheme will be of interest to our readers.



RAFT COMING DOWN THE COLUMBIA RIVER IN TOW OF TUG, WITH RIVER STEAMER AFT TO ASSIST IN ROUNDING TURNS IN THE RIVER.

Nine years ago H. R. Robertson, of St. Johns, N. B., patented the Robertson cigar-shaped raft. He built a raft of logs at Port Joggins on the Bay of Fundy in 1888, which was towed to sea by the steamship Miranda, bound for New York. When half way on its voyage over the Atlantic, during a heavy storm the hawser parted; the sea was rough, and the steamer was unable to recover her tow, finally abandoning it. It drifted over the sea, and at last went ashore on the Western islands, off the coast of Africa. The inventor returned to Port Joggins and began building another raft on the same general lines, with some improvements suggested by experience. This one was successful, being towed to New York by the tugs Underwriter and Ocean King, the seven hundred miles being accomplished in ten days. Since then several rafts containing millions of feet of timber have been transported from New Brunswick and Nova Scotia to New York in this manner.

Mr. Robertson came to this coast two years ago, and, with W. E. Baines, built on the Columbia river a plant for the construction of these rafts, and prepared a raft for shipment here. It sailed from Astoria, Oregon, in tow of the tug Monarch October 12, 1894, but struck severe weather and was finally wrecked, having made about 150 miles of its 600-mile journey. The owners lost heavily, but pluckily concluded to try it again. Accordingly, last March, at Stella, Washington, they built a big cradle or frame and started putting together another raft. This frame was somewhat similar to the gridiron frame used in shipyards for the construction of large vessels, and it conformed in many respects to the lines of the whaleback type, the chief difference being that this frame was anchored to a row of piles by means of loose anchor boxes, with sufficient play to admit of the frame rising and falling with the tide. The frame was also constructed by an arrangement of key pins, which, on being drawn, admit of the frame falling apart in complete halves, thus releasing the raft when constructed.

In May the raft was about half built. The illustration on page 88 shows how the giant structure looked at this stage of its construction. The photographs from which the cut on page 88 was engraved, as well as that one on this page, were taken specially for the MINING AND SCIENTIFIC PRESS, the enterprise being deemed of sufficient interest to warrant extended notice in this journal. The raft was completed the first week in July. It was towed to Astoria, Oregon, seven miles from the mouth of the Columbia. The engraving on this page is from a photograph of the raft in tow of the tug and a river steamer alongside as it passed down the Columbia river. The point selected by the photographer for the view is in Cathlamet bay, about three miles above Tongue Point, which is seen on the left of the picture, and which is two miles east of Astoria, where it arrived on the 26th ult. The steam tug Mineola made fast to the huge raft at noon on the 27th, crossed out to sea at a four-knot rate and in a comparatively smooth trip down the coast, passed Point Reyes at 9 A. M. on the 1st, arriving safely at Alameda Point, San Francisco bay, at six that afternoon, 600 miles in five days and six hours.

The raft is 580 feet long, and is shaped like an immense cigar. It is fifty-two feet in width; its girth at the midship section is 139 feet, and at the ends of the tapered sections forty-five feet. Where built at Stella, about ten thousand logs were hoisted by means of donkey engines into the cradle, which gradually settled down in the water. When completed the top of the cradle was on a level with the water, while the top of the raft was ten feet above it. When all the logs were loaded into the cradle the raft assumed the shape of a cigar, tapered at both ends; it was then bound together with heavy chains. The main chain, running fore and aft the entire length of the raft and through its center, is of one and seven-eighths-inch iron. Running at right angles to the main chain, and at regular intervals of twelve feet, are cross chains of one and a quarter-inch iron. These are connected with the main chain and run to each side of the raft. These chains are in turn secured to encircling chains of one and three-eighths-inch iron, which encircle the outer circumference of the raft, also at regular intervals of twelve feet. All chains are connected with the main chain in such a manner that when the strain of towing came on the main chain the strain was brought to bear equally on every chain in the

(Continued on page 88.)

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San Francisco, August 10, 1895.

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MUCH is being said and sung about the cost of producing an ounce of silver, and the cost of producing a similar quantity of gold. In the recent Harvey-Hoar debate (which leaves everything as it fouud it), it was brought out that in isolated instances it cost only sixty cents to "produce" an ounce of silver. But this proves nothing any more than is shown by the report of a Colorado mine broker, received here, to the effect that in one instauce gold is produced there at a cost of forty cents an ounce. The man who, walking along the street, finds and picks up a $20 gold piece, had that "produced" for him at a cost, to him, of less than one cent, yet it cost some one $20. As well use the cost in the finder's case as in another isolated case where fortuitious and extraordiuary circumstances make it possible to "produce" gold for forty cents an ounce or silver for sixty cents an ounce. Taking a larger view of it, it is probable that every ounce of silver mined in the world represents a cost of more than $1.25, and every ounce of gold more than $20.

IN the great Horr-Harvey debate the monometallist champion reiterated the old short-sighted statement that owners of silver mines were alone desirous of and interested in the bimetallic staudard: that they wanted a market for "pig silver," and that it was simply a question of marketing their production. In sayiug this, Mr. Horr shows his lack of comprehensiou. Such silliness is unworthy any one claiming sufficient intelligence to discuss the matter. A pointed negative to his proposition comes from Ohio, which is largely "a gold bug" State. The Standard Wagon Co. of Cincinnati failed last week: assets, $300,000: liabilities, $400,000. The company had plenty good orders and was honestly and efficiently managed. The president of the concern was asked the reasou for the failure. His answer is worthy of study by Mr. Horr and statesmen of his school. He said thcy carried a large indebtedness, and added: "While our mercantile creditors were generous, our bank creditors were not. The banker's dollar has its purchasing power almost doubled, while the manufacturer aud business man's dollar invested in buildings, machiuery and merchandise is reduced fully 50 per cent." There is the whole silver question iu a nutshell. It affects the merchant, manufacturer and producer more than the miner. The miner is in the same position as the man in the wagon drawn by the runaway team, who said he could ride as fast as they could run.

The Hale and Norcross Decision.

"All things come to him who waits," even to waiters for legal decisions. Last Saturday the Supreme Court of this State gave its decision in the celebrated Hale & Norcross suit. It will soon be five years since M. F. Fox began suit against the Hale & Norcross Mining Co., the Nevada Mill and Mining Co., H. M. Levy, Hayward, Hobart, et al. In August, 1890, Fox, delegated by an association of the stockholders of the mine, wrote to the directors that he had conclusive proof that for three or four years the stockholders had beeu systematically robbed by a ring controlling the output of the mine and the manageineut of the mill; that over $2,000,000 had thus been wrongfully withheld, and demanding restitution. No notice being taken of this, he began suit in October, '90. The trial began before Judge Hebbard of the Superior Court November 18th, '91, and was sensational. In May, '92, the Judge rendered a decision which was a surprise to many. Messrs. Levy, Hayward and Hobart were decided to be parties to a conspiracy to rob the mine by dishonest manipulation of the ore in the Nevada and Mexican mills. Judgment was pronounced against them and the Nevada Mill aud Mining Co. for $1,011,835. The other directors, A. K. P. Harmon, C. P. Eagau, C. S. Wheeler and J. Marks, were found guilty of negligence, aud judgment entered against them for $208,172; E. B. Holmes was held responsible for $60,905, and J. Souther, W. E. Sell and C. T. Bridge for $12,045. The enormous costs in the suit were also put ou the defendants. Their motion for a uew trial being denied, they appealed to the Supreme Court. The case has been before that court a long time and many unjust things have been said on and off Pine street regarding the delay. Much of this criticism has been undeserved. The case did not get before the Supreme Court as at present constituted till January 22, '95, and its magnitude, as well as the multiplicity of record matter, made it impossible for the court to give a decision much sooner. The transcripts of the testimony, the briefs, arguments, etc., make over 15,000 printed pages. Chief Justice Beatty, who wrote the decision, is one of the slowest of men. He was slow when judge of the District Court in White Pine, Nevada, twenty years ago; he was slow when subsequently Chief Justice of the Nevada Supreme Court, and age has not contributed to the celerity of his mental movements. But of his integrity or of the motives of his colleagues not one derogatory word cau be said.

The verdict is a victory for the plaintiff; Judge Hebbard is partially sustained; the case is sent back to his court for a new trial on some of the issues; judgment is given against Hayward and Levy for $210,000 and interest, and to the lower court is left to say how much more. In the first part of the decision the court goes over the facts recited before the lower court.

That during the three years 1887, 1888 and 1889, the Hale & Norcross mine delivered to the Chollar, Nevada mill and to the Mexican and Vivian mills not less than 80,000 tons of gold and silver ore; that the ores were worth not less than $3,250,000; that Haywards and Hobart were the biggest stockholders in these mills; that these two men conspired with the directors to gather all the fruits of the mine at the expense of the stockholders; that they used proxies to capture places on the directorate and so maintained themselves in power; that they used this power to seleet the agents and employees about the mills and mine; that they directed the ores to the mills owned by them and caused the superintendent of the mining company to suppress in his reports the real assay of the ores; that the mine reports were doctored to conceal the fraudulent gains of the combination; that low grade ores were mixed with high grade ores to run up the milling bill for the owners' benefit; that imperfect milling was done so as to leave gold and silver in the tailings, slimes and residues, all of which were carefully rehandled to the profit of the combination and to the loss of the stockholders for over $1,000,000; that exorbitant rates were charged for the milling and $280,000 was lost that way; that 6,000 tons of ore, valued at $480,000, was shipped away, lost ou the books and never accounted for, and that altogether $2,000,000 at least was filched from the pockets of the unsuspicious stockholders and divided by the conspirators.

We shall first consider, says the Court, that in relation to the conspiracy to mine and send to the mills ore not worth the cost of mining and reduction. Although the Superior Court finds that worthless ores were mined and milled to the loss and damage of the company, the amount of such damage is not found, and it does not enter into the judgment rendered against any of the defendants—the damages awarded by the several judgments consisting of hut two items, viz: The excessive price paid for milling all the ores, rich and poor, and the bullion lost hy imperfect milling. But as it affects the motion for a uew trial, and as indicative of the views of the Superior Court as to some items of evidence, which equally affect other questions, it is deserving of some attention.

According to the testimony of Mr. Mackay—and there is nothing to the contrary—ore of a car sample value below $14 per ton will not pay for the cost of reductiou, hy which I understand him to mean that such ore will pay the hare cost of mining in a going mine, added to the bare cost of milling, witbout any profit to the miller or compensation for the use of his mill. His meaning, in other words, is that a mining company, with its mine already opened and in running order and owning its own mill, could hoist and mill $14 ore without going behind. In any other sense his testimony on this point is inconsistent with his testimony as to the usual disparity between the car sample assay and the battery sample assay and the percentage of the latter that ought to he obtained by good milling. In order, however, that $14 ore may pay expenses, it must, according to Mr. Mackay, contain about an equal value of gold and silver. Otherwise, owing to the heavy discount on silver, it will not pay. Now, the evidence in this case shows that the foreman of the Hale and Norcross mine was in effect instructed to mine and send to the mill ore assaying hy car sample as low as $12, and it appears that the Hale & Norcross ore contained a much larger percentage of silver than of gold.

In view of these facts, which show that the practice and the iutention was to send to the mills all ores assaying by car sample as high as $12 per ton, and in view of the understanding that the mills are to receive not merely the bare cost of workiug the ores, but $2.50 in addition to the cost for the use of the mills, it cannot be said that the finding of a conspiracy to mine worthless ores is without any support in the evidence.

I account for the fiuding and for the fact that no damages are awarded hy reason of it in this way: The Superior Court held that, in view of the contract or understanding, that $7 per ton was to be paid for the milling, and the actual return in hullion of only about 75 per cent of the battery sample assay, the parties must have known that only $14 ore, hut ore of eveu a higher grade was being mined and reduced at a loss. In determining the question of damages, however, all losses were comprised under two heads, viz: excessive price paid for milling, and loss hy imperfect milling. In order to determine these amounts the milling was reduced to actual cost, and the defendants were charged with 75 per cent of the car sample assay. This being done, there remained no appreciable loss on the milling of low grade ores, except up in the comparatively small quantity assayiug less than $12, which the court was justified in finding was unintentionally and unavoidably deposited in the ore bins before the assays could be returned. The calculation upon which I suppose the court to have proceeded would he as follows: 75 per cent of $14 is $10.50, or gold $5.25 and silver $5.25, which at 80 per cent equals $4.20, making a net yield of $9.45, of which $4 50 was allowed for milling and $4.95 for cost of mining. I do not think that this basis of calculation was entirely correct, in view of other evidence in the case, hut it was the hasis upon which the court seems to have proceeded, and assuming its corrections, the finding in question and the conclusion of the court are rendered perfectly consistant.

Upon the whole I thiuk the evidence sufficient to sustain the finding.

The next and hy far the most important exceptiou to the decision of the Superior Court relates to the various findings to the effect that Hayward, Hobart, Levy and the other defendants worked the ores of the Hale & Norcross Company hy a fraudulent system of imperfect milling, hy which a large portion of their value was left in the slimes, tailings and residues of the mines. The substance and effect of those fiudings is that 88,887 tons of ore were worked; that its value was $3,505,361, as correctly shown by the car sample assays, and that if said ores had been honestly crushed and milled, and the gold and silver honestly and with reasonable care extracted and accounted for, the bullion yield would have been $2,616,491, whereas the actual return made hy the mills was only $1,826,883, and the difference between these two sums, $789,618, is the priucipal item of the damages going to make up the judgment. The principal and most direct evidence in support of this finding consists of the car sample assays, which, it is contended, is corroborated and confirmed hy proof of certain irregular and suspicious transactions hetween the managers of the mills and the Carson Mint, as well as some other circumstances of like complexion and import.

The appellants contend that, even taking the car sample assays as a criterion of the amount of gold and silver in the ores mined and sent to the mills, the estimate of the Superior Court is erroneous and excessive to the extent of $34,427, and they sustain their contention hy a citation of the pages and folios of the record, to which counsel for respondents have made no reply. If there is any mistake in the computations which apparently demonstrate the error alleged, it was the duty of counsel to bave pointed it out. In the absence of any attempt to do so I should perhaps have been justified in assuming that the error was conceded. I have, however, gone over the figures as carefully as I could, and while my computation does not exactly agree with that of counsel for appellants, it does agree substantially. The error of the Court amounts to over $30,000, the larger portion of which is found in the first item of the account, where 1259 tons and 1500 pounds of ore delivered at the Vivian mill in December, 1887, of the car sample value of $72.12 per ton, is found to have amounted to $113,518.41, when its real value was only $90,856.41, an error of nearly $23,000 in one item.

But the appellants contend that the car sample assays do not, as found by the Court, correctly show the true value of the ores, and in this connection they call attention to what they say is an inconsistency between the findings that the value of the ore was $3,505,361 and that it should have yielded $2,616,491 in hullion. I do not deem this an inconsistency. One stands for the total amount of gold and silver in the ores and the other for the percentage (about 75 per cent) which, in the opinion of the Court, it should have yielded under proper treatment.

This objec'ion disposed of, we come to the pivotal question in the case—the value of the car sample assays as a criterion of the value of the ore. The testimony is without conflict that, according to the general custom and course of dealing between the miners on the Comstock lode and the managers and owners of custom mills, the battery samples are, and the car samples are not, regarded as the true index of the value of the ores; that all settlements between miner and miller are hased upon the average assay of the battery samples, and the car sample assays are for the guidance of the miners, and useful as a check upon the mills. There is also no conflict in the evidence that the car samples always run above the true value of the ore. This fact was clearly proved when the plaintiff closed his case, in chief hy the testimony of his own witness, John Mackay, and it was much more fully proved by a number of witnesses sworn on behalf of the defendant.

The miling of the Hale & Norcross ore was not in itself an unlawful act. The means hy which the employment to mill them was obtained was wrongful, and entails the penalties which are to he considered hereafter; hut the milling, if properly conducted, was a lawful, legitimate and necessary operation. The form of the ores was, of course, changed, and their identity destroyed, hut the usual means and the only means of establishing their value was taken and the evidence preserved. They were the car sample and the pulp sample and the settler sample assays, all taken according to the usual course of husiness, and all preserved. They constitute the most direct and trustworthy evidence of the real value of the ores, while all other means of proof are indirect and secondary. So far as they are indefinite or uncertain, the willful suppression of any secondary evidence or corroborating circumstances which would tend to clear up such uncertainty, would justify a Court in giving to the direct evidence the strongest construction in favor of the other side that it would reasonahly hear. But, as has been shown, the evidence in tbeir case is all to the effect that the car sample assay is iuvariably and largely in excess of the actual value of the ore

and that it is not unreasonable in the face of such evidence to assume the car sample as a basis of computation. This is not holding that the respondent is bound by the battery samples, or that a deduction from the car samples of $10 per ton, or of any definite sum, must be made, but only that the trial court should give proper consideration to the uncontradicted testimony of all the witnesses and to make such deductions as in its judgment is reasonable, in view of all the evidence.

As to the claim that evidence was suppressed by failing to keep any record of the bullion resulting from the working over of concentrates, and by the refusal to produce the books of the Nevada Mill and Mining Company, the record does not bear out the assertions of counsel. There is no record kept in the mill of the workings of the concentrates, or, as far as appears, of any other part of the business. The books containing a record of the business of the mill were kept at the office of the corporation, and the testimony of Williams, the superintendent of the mill, is that the account of the proceeds of the concentrates of all the ore worked in the Nevada mill, amounting to 93,000 tons of Hale & Norcross ore, was kept in the books of the corporation and showed a product of only about $14,000. Mr. Williams, when the crude bullion was delivered to him by the foreman of the mill who had charge of the retorting, and who kept a memorandum of the weight, took the bullion to the assayer, who in a few days returned the resulting bars with his certificate of weight, fineness, value, etc., to the office, and he says that in the meantime he made no written entry of the weight, but carried it in his head. This may be a loose way of conducting business, but it is not a suppression of evidence. As to the refusal to produce the books of the company, counsel does not recite the evidence in the record, and I have been unable to discover that any demand for the production or inspection of the books was ever made.

My conclusion is that the Superior Court did not err in requiring the mill owners to account for $2.50 per ton for all the ores milled by them, and this part of the judgment, which is erroneous only so far as it includes the ores worked at the Vivian mill, may be modified upon the findings contained in the record. The proper sum is $2.50 per ton in 84,079 tons, the quality of ore sent to the Nevada and Mexican mills amounting to $210,197.50. To this extent the judgment against Hayward and Levy is fully warranted by the findings and evidence.

As to the Nevada Mill and Mining Company, it would be necessary to reduce this part of the judgment still further, on account of the fact that it had nothing to do with the ores reduced at the Mexican mill; but this and all other errors in the proceedings affecting that corporation became immaterial in view of my conclusion that it was never brought under the jurisdiction of the Superior Court. It is a Nevada corporation, and the only service of summons was made on Evan Williams, the superintendent of its mill, at Virginia City, who was at time of service in attendance upon the trial of the cause, but not engaged in attending to any business of the corporation in this State. Such service was wholly insufficient to confer any jurisdiction over the company, and the judgment as to it is erroneous in toto.

As to the Directors of the Hale & Norcross Company, other than Levy, it is not seriously contended that they are liable except on the ground of negligence, and it is clear that such was the opinion of the Superior Court. But they were not charged with negligence in the complaint, but only with fraud. Fraud and negligence, however culpable, are not the same things. It is true that when negligence causes an injury of the same character as would be occasioned by an intentional fraud, it is visited with the same consequences, so far as compensation to the injured party is concerned, but the plaintiff has no right to demand a conviction of fraud when no fraud has been committed. When he relies on fraud he ought to plead fraud and when he relies on negligence he ought to plead negligence, not only because the defendant has the right to know what the charge is which he is called upon to meet, but because the defenses are different. An action for relief on the ground of negligence is ordinarily barred by the statute in a shorter time than action for relief on the ground of fraud. In this case, however, it is contended that the action against the directors is founded upon a liability created by statute, and, consequently, that the same limitation of the right to maintain the action applies as in cases of fraud. (C. C. P., S. 338.) The statute referred to is Sec. 3, Art. XII of the Constitution, which contains the following provision:

"The directors or trustees of corporations and joint-stock associations shall be jointly and severally liable to the creditors and stockholders for all moneys embezzled or misappropriated by the officers of such corporation or joint-stock association during the term of office of such director or trustee."

This clause of the Constitution has never been construed, so far as I can discover. According to its literal terms every director of a corporation is severally liable for the full amount of any misappropriation of its funds during his term of office, without respect to any question as to his own culpability, and the argument of counsel is that it must be enforced according to its letter. *Ita lex scripta est*, and hence a director, no matter how innocent he may be, must be adjudged to pay, at the suit of any stockholder, the whole of any misappropriation of corporate funds accruing during his term of office. And, therefore, according to the contention of counsel, if some large stockholder of the Hale & Norcross Company, with the sole purpose of protecting his own interests and the interests of the other stockholders, had, by cumulating his stock, secured an election to the board of directors, and as a member of the board opposed the milling of low grade ores, or the paymeat of more than $4.50 per ton for milling, and had to the utmost of his ability guarded the interests of the company in every direction he could, nevertheless, have been singled out by any stockholder and compelled to make good the entire loss caused by the willful and corrupt misconduct of a hostile board.

If this construction must obtain, then no man with any property or character to lose will be willing to serve as a director of a California corporation after it becomes known that the Constitution contains such a provision. I do not think, however, that the construction contended for can be allowed. It does seem that it was the intention of the framers of the Constitution to make each director of a corporation severally liable, whether individually culpable or not, for certain kinds of losses to the corporation occurring during his term of office. That is to say, he is made liable for embezzlement or misappropriation of corporate funds by officers of the corporation. In my opinion the word "misappropriation" is to be construed by the maxim *noscitur a sociis*; it means something like embezzlement, or, in other words, it means the misapplication of funds intrusted to an officer for a particular purpose, and does not apply to the payment of an extravagant price for services or material properly appertaining to the business of the corporation—which is this case. For losses occasioned by such means the law affords an ample remedy, without the need of resorting to the Constitution against those who are justly responsible, whether by reason of fraud or negligence; but the law does not in such cases visit upon the innocent the sins of the guilty, and if the liability arises from negligence the action must be commenced in two years after it accrues, whereas, if it arises out of fraud it may be commenced at any time within three years after the discovery of the facts. In this case, if the directors had been sued for negligence only in paying too much for milling the ores, the statute of limitations would have been a complete defense as to some of them, and a partial defense as to others. For

(*Continued on page 90.*)

Concentrates.

A MINER'S UNION has been formed at Rossland, B. C. It is a $3 camp and young.

THE Bullion-Beck (Utah) will distribute no dividend this month nor next month.

WM. CLAYPOOL, of Prescott, Arizona, has bought the Cleveland mine at Chapparel for $15,000.

L. SEINOR of El Dorado has a contract to sink the shaft at the Gwin mine 250 feet at $18 per foot.

THE Bodie *Miner* says that J. Cain will erect a 100-ton cyanide plant on Booker Flat next spring.

THE Osborn Hill mine, Nevada Co., will not be shut down, as rumored, but will be still further developed.

THE company that owns the Snowshoe group of mines will build a 100-ton concentrator near Libby, Montana.

J. B. MOFFITT, of Stockton, will operate ten of his machines for reducing refractory ore in Deadwood, South Dakota.

THE 30-stamp mill on the Hayward & Lane mine, near Juneau, Alaska, is finished. Fifty Californians built it.

THE Byron N. White Company has decided to erect a concentrator for the Slocan Star mine, Slocan district, B. C.

THE steam dredger and boat for the Brown's Valley Mine Company have been successfully transported to Marysville.

J. C. DAVENPORT, of Spokane, Wash., has bought the Homestake mine at Rosslund, B. C., for $35,000, paying $3000 thereon.

THE Scieffard mine, at San Andreas, Calaveras Co., has been bonded by San Francisco men for $20,000, for forty-five days.

KISE BROS. are having a dredge built at Redding, patterned after the Diestlehorst dredge on Middle Creek, for use on Trinity river.

THE Utica mine is being pumped out at the rate of 60,000 gallons an hour, and it is thought the lower levels will be dry in ten days time.

THE report of the Denver branch mint for July accounts for the receipt and treatment of $573,017.80 in gold, compared with $737,501 in July, '94.

DURING July the United States Assay Office at Helena, Montana, handled $285,000 worth of gold. During July, '94, $188,500 was handled.

A 100-TON concentrator is to be built at Nelson, B. C., to treat the Silver King ore. The machinery has been ordered from Fraser & Chalmers.

IF Mr. Burton of Boston, Mr. Houlahan of Chicago and Mr. Tefts of Sacramento combine forces, electro-metallurgy may be given considerable impetus.

IN a column editorial the Virginia *Enterprise* asserts that the suit of Spring against Supt. Lyman of the Con. Cal. & Va. is simply spite work and blackmail.

GOLD deposits have been found near Bokhara by M. Portorsky, a Russian Government mining engineer, which, he asserts, are practically inexhaustible.

R. F. L. HALLOCK is about to operate at the historic Jones Bar on the Yuba, and has reason for belief that he will strike good gravel deposit above the old bar.

J. B. MOORE, of Oakland, has a dry washer in operation three miles above Cool, near the Georgetown road, on Five Cent hill, Greenwood mining district, El Dorado Co.

UNDER date of the 30th ult., J. B. Sellier writes from Bath, Cal., that the tunnel being run by him is on the New Treasure, and is in no way connected with the Mountain Chief.

P. FAGAN has bonded the Mechanics mine, Sutter Creek, to Valentine Bros. of this city for $12,000, payable Oct. 1st, '95, May 1st, '96. Machinery will be put thereon and development work done.

THE San Francisco Mining Company has incorporated in this city with $1,000,000 capital stock. Shareholders: A. Meyer, $500,000; J. M. Nougues Jr., $499,850; Joseph M. Nougues, E. L. Lowe and B. Vale, $50 each.

THE holders of the controlling interest in the Mercur (Utah) Gold Mining & Milling Company, and as many others as might desire to unload, recently refused an offer from Captain De Lamar on a basis of $1,000,000 for the mine.

UNDER date of August 3d, our Picacho, San Diego Co., correspondent writes that the American Girl mine at Cargo Muchacho has been sold for $120,000. It was bought, with three other claims, a short time ago for $5000.

H. H. WALKER, one of the auditors of the Canadian Grand Trunk Railway and secretary of the American Development and Mining Company, was suffocated by foul air in one of the company's mines near Whitehall, Montana, last Sunday night.

AT last Monday's meeting of the Debris Commission M. Cortez was granted a permit to operate the Sailor Boy hydraulic mine in Sierra county. Impounding dams were authorized at Big Ravine, Nevada county, and Lost Camp, Placer county.

SENATOR GLEAVES tells the Redding *Free Press* that this month the Altoona mine at Cinnabar "will produce 728 flasks of quicksilver at a net profit of $35 per flask, or $25,480," which seems a trifle exaggerated, both in quantity and amount.

THE Red Star Mining Co. is building a dredger 18x60 feet, "embodying the best features of five different mining processes," equipped with pumps and piping to dredge to the depth of 100 feet, to operate on the Snake river below its confluence with the Payette.

THE powers of the multiplication table are being taxed to exemplify the aggregate amount of gold in the ocean which gentlemen from New Hampshire and Indiana propose to extract. There is about a grain of gold to a ton of seawater. The gold is there all right enough; to a Californian it looks like a low grade proposition; very low.

AT the Witwatersrandt, South Africa, in a month's work, 2400 stamps, working night and day, crushed 265,716 tons of stone, yielding 119,114 ozs. 16 dwts. gold; while 43 cyanide plants treated 221,698 tons of tailings for a recovery of 52,099 ozs. bullion, valued at £156,461. The average yield of gold per ton from the mills was 8.96 dwt., and from the cyaniding 4.70 dwt.

NEXT week the Golden Cross Mill and Mining Company, at Ogilby, will start up a 60-stamp mill having a capacity of about 200 tons a day. The same company intends putting up another 40-stamp mill as soon as they get the new 60 stamp one going. With these two new ones they will have altogether 140 stamps, which will give them a capacity of over 400 tons of ore a day.

IN a recent decision in the case of the Louisa Mining Company, on appeal from the Marysville land office, it is held by the Commissioner of the General Land Office that to show discovery of mineral to comply with the prior decisions there must be a discovery in each twenty-acre tract embraced in said claim. As the mineral claim at technically failed to do so, the application was cancelled.

THE company organized by G. J. Atkins to work placer ground on the Columbia river above Revelstoke has had a force of men, under the direction of "an expert from New New Jersey," prospecting the ground for over two months. Whether the ground will be worked on a large or small scale depends on his report. Mr. Atkins and his associates have spent about $100,000 prospecting the ground.

THE Broken Hill Proprietary Co., Limited, of Australia, reports: "Profit for the half-year to May 31, £345,000; value of ore extracted, £3 3s 9d per ton; cost of production, £2 1s per ton." The company reports that for the week ending July 18, 8294 tons of ore were treated, yielding 606 tons of lead, containing 173,799 ozs. silver; also 1638 tons treated by amalgamating and leaching plants, producing 16,895 ozs. silver.

THE contest of E. O. Roberts, quartz claimant, versus B. Pendola, placer claimant, has been decided in the Sacramento land office in favor of the former. It involved about seven acres of ground, claimed within Pendola's location. The question at issue was whether at the date of the placer application in November, 1892, there was a known gold-bearing quartz lode thereon. The ground adjoins the Kennedy on the east.

FROM the last number received of the Melbourne *Argus* the following is taken:

> TO INVESTORS AND OTHERS.—Gentleman possesses reliable and valuable information re gold mine, whose shares can now be bought cheaply. In month's time will have 200 per cent rise. Enclose fee £1 in application. Write for information to ———

Cheap enough! The wonder is that a respectable paper would aid such a swindle.

THOMAS G. MERRILL, president of the Montana State Board of Mineral Land Commissioners, has made a statement in reply to the report from Washington as to the cost and alleged dissatisfaction with the classification of mineral lands within the Northern Pacific grant by the Government commissioners. He declares the statements of Commissioner Lamoureux to be gross misrepresentations and without foundation in fact. Instead of costing the Government 25 cents per acre for classification, the actual expense so far has been 1 1-5 cents per acre, and the work has been eminently satisfactory to the people.

RECKONING fine gold at $248 per pound troy, there are seventeen metals said to be more valuable, viz.: Iridium, valued at $300 per pound troy; gallium, $375; rhodium, $425; osmium, $600; ruthenium, $1000; palladium, $1080; barium, $1400; didymium, $2500; cerium, $2600; yttrium, $3150; strontium, $3350; calcium, $3500; glucinum, $4100; lithium, $5100; zirconium, $5575; rubidium, $7000; vanadium, $8625. Osmium, with a specific gravity of 22.5, is the heaviest known substance; while lithium, with a specific gravity of 0.59, is the lightest metal known, and will float in the lightest known fluid.

A SHASTA, CAL., dispatch says that two men who have been prospecting on Trinity mountain for the past month found a pocket a few days ago near the foot of the mountain, twenty-five miles from there and about midway between Shasta and Trinity Center, which contained $11,200 in gold dust. That beats the "$140,000 to the ton" of sylvanite found by W. S. Stratton's men at Victor, Colorado. Some of the old Shasta residents living believe the gold found at the foot of Trinity mountain was buried there by robbers who in early days robbed Wells, Fargo & Co. frequently in the neighborhood of the find.

THE Montana Supreme Court has affirmed the decision of the lower court in the case of Chas. Kelly vs. the Fourth of July Mining Company. This suit hinged on the question whether a mine owner or his representative is supposed to furnish and sufficiently and safely timber a tunnel of a mine being worked, or whether the miner is to look after his own safety in that regard. The plaintiff, on May 27, 1891, was rendered helpless for life by the alleged negligence of the defendant in not properly timbering the tunnel, a quantity of dirt and rock falling upon him in consequence. He sued for $50,000, and was awarded $15,000 damages.

IN the Transvaal, South Africa, two railway companies have been building from Delagoa Bay and Durban, in Natal. The first-named and shorter line, the Netherlands South African railway, which is an extension of the Delagoa Bay and East African railway, to Pretoria, was finished July 8. The distance is about 350 miles, while the competing line under construction from Durban, and to be finished in a few weeks, will be a little longer. The new road, like all South African railways, is of three-feet gauge. The Johannesburg region was already reached by rail from Port Elizabeth, on the south coast, a distance of some 730 miles, and from Cape Town by the long journey of 1030 miles, but the completion of the direct line from the east coast will greatly facilitate development. Several branches are under way into the gold fields.

THE Yreka *Union* is publishing two notices from land office at Redding notifying the public generally that the C. P. R. R. Co. has applied for a patent to lands in township 39 north, range 1 east, township 39 north, range 1 west, township 39 north, range 2 west, township 31, 46 and 47 north, range 5 west, township 30 north, range 6 west, and towaships 30 and 44 north, range 6 west, all of Mount Diablo Meridian; also in township 43 north, range 9 west, and township 47 north, range 10 west, all of Mount Diablo Meridian. Within the next sixty days following the date of the notices, Aug. 1, protests or contests against claim of the company to any tract or subdivision described in the list, on the ground that the same is more valuable for mineral than agricultural purposes, will be received and noted for report to the General Land Office at Washington, D. C.

Cheap Ocean Transportation.

(*Continued from page 85.*)

structure. In addition to this a hulkhead of heavy timhers was placed on each end of the raft and kept tightly in place hy heavy steel cables running through the raft from oue bulkhead to the other. It contains ten thousaud logs of various sizes, ranging in length from thirty to seventy-five feet. The logs contained in this raft are of small diameter and are mostly pile timber. They will he used principally in the construction of wharves aud piers in and about the Bay of San Francisco. The quantity of timher contained in the raft is four hundred thousand lineal feet, the equivalent in board measure of about six million feet. The raft is thirty feet in depth, and draws hetween twenty and twenty-one feet of water. The logs contained in it, if placed end to end, would reach a distance of seventy-six miles. The total weight is estimated at ten thousand tons. At the usual rates the freight bill would he over $21,000. Towed down in hulk the whole expense of trausportation from Astoria to San Francisco will not he over $1500. The whole thing—lumber, chains, cost of constructiou, and everything—cost $37,500 as it lies at Alameda Point.

Capt. Pillsbury kept a log of his trip, and reports a smooth sea and a light, southerly breeze, with clear weather all the way down. He had 190 fathoms of rope aud 70 fathoms of chain on the tow, kept four lights on the raft at night and two men on it in the daytime, and had uo fears of the result. The Mineola, which hrought the raft through in safety from start to finish without extra aid or help, is 275 feet over all, 37 feet heam and draws 20 feet of water aft.

The economy of such a proceeding is obvious. Apart from the great saving in freight, there is a saving in material. The slabs, edging and other waste, which in northern ports can hardly he given away, are here valuahle for firewood and can he sold for more than enough to pay for hringing down the whole consignment. The lumber can be sawed here, affording employment to that many more, and the manufactured product furnished city consumers at a cheaper rate than ever hefore.



FILLING CRADLE WITH LOGS—RAFT ABOUT HALF BUILT.

South African Gold Output in 1894.

The report of the Minister of Miues of the South African Republic for 1894 gives the official figures of the gold yield of that extensive State for '94, together with a mass of interesting statistical iuformation regarding the South African mining industry. The gold yield of the several districts is as follows:

	Ounces.	*Value.*
Witwatersrandt	1,949,939	£6,718,168
De Kaap	87,483	298,598
Klerksdorp	78,358	264,724
Lydenburg	60,276	173,275
Heidelburg	52,685	172,340
Zoutpansberg, etc.	11,134	40,017
Grand total	2,239,865	£7,667,152

The De Kaap field milled 95,443 tons of quartz, yielding 46,603 ounces of gold, valued at £175,239, or 0.49 ounces per ton. The average value per ton of milled ore in the Klerksdrop district was 17s 2d. From the Lyndenhurg 63,968 tons of quartz crushed yielded 32,452 ounces, valued at £111,242, or ahout £1 14s 9d per ton. By the cyanide process 29,496 tons of tailings, having an assay value of 0.53 ounce per ton, gave bullion worth £56.772, or an average of about £1 8s 9d per ton; 1490 ounces were ohtaiued from alluvial. The average assay value per ton of the gold ohtained from the Heidelburg gold field was 1.093 ounce, or £3 16s 10d. Tbe tailings gave an average value of £1 11s 1d per ton. The Randt yielded 88 per cent of the whole.

The number of companies is 141; capital, £24,702,815; cash supplied, including payments to promoters, £7,869,811, or 34.3 per cent. The following shows the importation of machinery for '93 and '94:

	1893. *Horse Power.*	1894. *Horse Power.*
Steam engines and lighting, turbines, etc.	25,299	26,219
	Value.	*Value.*
Steam engines and lighting, turbines, etc.	£ 769,069	£1,079,314
Hoistiug, pumping, compressing machinery	222,930	316,495
Tramways, elevators, etc	227,605	223,580
Workshops, etc	33,046	60,766
Reduction machinery, mills, crushers, vats, etc	1,376,217	1,690,190
Total	£2,627,816	£3 370,345

The total gold production in 1894 was 2,239,865 ounces, worth £7,667,152—an increase over 1893 of £2,186,654. or 39 per cent. Of this 68 per cent, or 1,457,103 ounces, were ohtained from milling operations, and the rest by cyanide treatment of tailings and concentrates. The tonnage of ore milled was: 1893, 2,482,159 tons; 1894, 3,269,462 tons, or an increase of 787,303 tons, equal to about 31 per cent. In the latter year 4991 stamps were at work, having an average weight of 834 pounds each. The average crushing for each stamp every 24 hours was 3.63 tons, and the yield therefrom 0.446 of an ounce of gold, valued at £1 12s. 1d. From tailings 694,625 ounces of gold were obtained, of the value of £2,091,730, or 27.3 per cent of the total output. The average assay value of this residue was 0 255 ounces of fine gold, and worth ahout £1 1s. 3d. per ton. Of the total quantity of tailings treated 3,048,798 tons were by the MacArthur-Forrest process and 30,757 tons hy other methods. Concentrates yielded 84,471 ounces of gold, valued at £318,909, or 4.1 per cent of the total yield. The average assay value of the concentrates of the Witwatersrandt conglomerate heds was 3.16 ounces; that of the quartzite heds of Barberton 6.09 ounces; 13,060 tons of ore, of an assay value of 4.41 ounces fine gold, equal to £18 7s. 10d. per ton, were treated hy the chlorination process, yielding gold to the value of £17 15s. 6d. per ton of ore, or ahout 96.6 per cent of the gold contained; 11,341 tons of concentrates, of an assay value of 2.29 ounces of fine gold, worth £9 11s. per ton of ore, treated by the cyanide process, yielded bullion to the value of £7 12s. 7d. per ton, or 79 per cent of the assay value. The yield from alluvial was about 3666 ounces, valued at £12,806, or 0.2 per cent of the total output.

The output for nine years is showu in the following table, supplied by the report:

Year.	*Ounces.*	*Increase.*
1886	10,632	8,925
1887	48,960	38,928
1888	279,600	230,640
1889	430,800	151,200
1890	540,360	190,560
1891	835,516	295,156
1892	1,389,498	553,982
1893	1,575,397	585,899
1894	2,239,864	664,468

A gross total of 7,254,683 ounces.

The Harqua Hala Mines.

To the Editor:—The Harqua Hala mines, well known as the greatest gold producers in western Arizona, are in honanza again. The rich strike lately made continues to widen, lengthen and improve as it is opened, and shows that the late Geo. W. Bowers, of San Francisco, one of the late owners, was right when he said: "Go in on that 200-foot level and you will strike the richest and largest hody of ore ever fouud in the Bonanza mine," but the experts and mining engineers differed, aud they sunk here and there, hut to no purpose, when finally the news came that the mine was played out and would be closed down. All but a few of the men were discharged and it looked as if the Bonanza mines were things of the past.

The new manager, hearing of the saying of Bowers, took the idea and went to work on the 200-foot level, with the result of finding what appears to be the hest hody of ore ever discovered in the mine. Forty sacks of the ore yielded $40,000. Men now stand guard over the ore piles; the miners are carefully watched as they leave their work, all going to show that the ore is very rich.

The Eugasser mine, lying a little east, is also turning out very rich, being in very rich ore at the bottom of the 200-foot shaft. The owners will put up a 90-stamp mill at once.

The Thomas mines, fifteen miles southeast of Yuma, bonded for $150,000 uutil October, are holding out well, with the chances now that the sale will he made.

The ore in the Estrella and Silver Prince mines, twelve miles northwest of Picacho, in the old Picacho mining district, owned by Guadalupe Martinez, is turning out good, carrying 25½ ounces of silver, $5 in gold and 35 cents in copper. The mines are ahout eight miles south of the Colorado river. The Gatanal canyon, which they cross, was rich in placer gold. They are within a mile of a great teuaja of water, which is permanent. The outlook for Yuma county's mines never was more promisiug.

Yuma, Arizona, July 28, 1895. E. M. G.

The Trenton Iron Works has made a contract with the Cataract General Electric Company for the construction and equipment of an experimental line of four miles for towing boats on the Erie canal by means of electricity. The electric power is to be taken from the Niagara Falls Power Company and the line is to be huilt at a point to he designated hy the superintendent of puhlic works in the vicinity of Tonawanda. The line is to he completed and ready for operation within sixty days. The cost of the system will be $2500 for a single mile, or $5000 for a line on each side of the canal. The equipment of the Erie canal will involve an expense of $20,000,000.

The report of the Geological Survey for 1894, discussing chromic iron ore, says "the entire product comes from California. The product of 1894 was more than douhle that of 1893, but the price remained nearly stationary at $15 per ton; 3680 long tons were produced." Chromic steel in relation to armor and armor piercing projectiles is very fully discussed. It is stated that the chromium does not itself increase the hardness of steel, hut iu combination with other suhstances gives it a superficial hardness equal to that of the Harvey process.

The successful use of electricity as a motive power on steam roads has led the Baldwin Locomotive Works and the Westinghouse Electric and Manufacturing Company to effect a comhination for the development of apparatus for the operation of steam railroads hy electricity.

Electrical Mining Plant.

The value of electricity in mining operations is no longer disputed. In the coal industry especially it has been received with favor, and in these days, when working expenses must be reduced, electricity has been found to offer to mine operators a means whereby great economy may be effected. The advantages which follow the adoption of electricity in coal mine operation are that it presents a system of the greatest simplicity, completeness and flexibility, permitting power from one source to be distributed in units of any desired size and for any purpose to the places where it can be employed to the greatest advantage, thereby securing the minimum consumption of power and expenditure of labor. With electricity there is neither friction, heat nor condensation. There is no leakage nor loss of power when not in use, which especially recommends it for intermittent work. It is not affected by heat or cold, and does not vitiate the air, as is the case with steam and compressed air. The rapid deterioration of timbering, a source of great expense in all mines, due to bad air and heat, is also to a great extent obviated.

An excellent example of coal mine operation is the electrical installation at the Mount Lookout colliery, at Wyoming, Pa., where locomotives, pump and drills are being successfully and economically operated by electricity.

This plant was installed by the General Electric Company, and all the electrical apparatus employed is of its manufacture.

The source of power is a McEwen high-speed engine, making 218 revolutions per minute. It is located in the power house—a brick building some 200 feet from the main shaft, and about 100 feet from the air shaft. Belted to this engine are two multipolar General Electric generators, one of 100 K. W. (135 H. P.) capacity, the other of 20 kilowatt (28 H. P.) capacity. Haulage, drilling and pumping in the mine are operated by current from the larger generator, while that from the smaller is taken for the incandescent and arc lighting circuits on the surface. In case of accident to the larger generator, the current from the smaller one can be utilized for power purposes.

From the two skeleton switch-boards in the power house the circuits are led, one to the surface, the other to the mine. The office, engine and boiler houses are lighted by incandescent lamps; the breaker and surrounding grounds by 2000 C. P. arc lamps.

The conductors for the mine operations are strung 300 feet down to the bottom of the air shaft, and consist of lead-covered cables for the feeders and returns. The feeders are carried along the main gangways parallel to the trolley wire, or through old workings or airways. The feeders are waterproof rubber-covered copper wires strung on insulators attached to roof blocks.

At the bottom of the shaft the feeders divide, one branch supplying current to the north workings, the other to the south workings. No. 0 hard drawn wire is used for the trolley wire, the rails being bonded for the return. The trolley is suspended from oak roof blocks by a special mining ear which clamps the wire but is not soldered to it.

Haulage in the north workings is effected by one electric locomotive, which weighs about 6½ tons, equipped with two single reduction waterproof motors. It has a draw-bar pull of 1500 pounds on the level at six miles an hour, while at starting it will exert a pull of 3500 or 4000 pounds without slipping the wheels. The extreme dimensions of this locomotive are 11 feet 4 inches long, 57 inches wide and 34 inches high. The total length of the gangway over which it operates is about 2800 feet, although, including sidings and turnouts, about 3000 feet of trolley wire is suspended in the north workings. The locomotive makes between 20 and 25 round trips per day. It is hauling at present seven loaded cars, but is capable of easily handling twice this number The grades vary from the level to 2.8% and all are against the empties.

Haulage in the south workings is effected by a locomotive equipped with two single reduction mo-



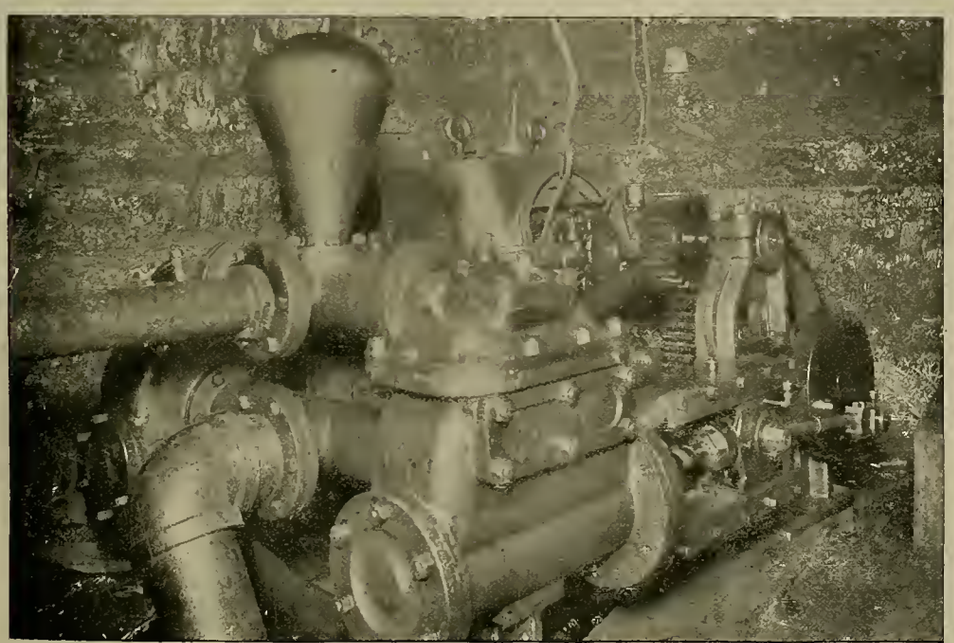
ELECTRIC LOCOMOTIVE IN WORKINGS.



MAP OF MINE.



ELECTRIC DRILL.



ELECTRIC PUMP.

tors, and having a draw-bar pull of 2500 pounds on the straight level at a speed of six miles an hour. At starting, however, it can exert a draw-bar pull of 4000 to 5000 pounds without slipping the wheels. The total weight of the machine is about ten and a half tons. It is 11 feet 4 inches long, 58 inches wide over all and 34 inches high. The maximum run made by this locomotive is about 1200 feet, and the length of the wire used, including turnouts and sidings, is about 1800 feet. At present this machine is hauling ten cars and making from 40 to 45 round trips, pushing in the empties and hauling out the loaded cars. In starting from the entries, *F*, *G*, *H* and *I*, where the trips are made up, the locomotive does its hardest work, as there is a sharp grade and curve against the loaded cars. Each mine car empty weighs 3000 pounds, and loaded 8000 pounds.

The south workings haulage line is to be exteuded from *H* to *K*, and through a rock tunnel to *L*. The branches, *F*, *G* and *I*, will then be abandoned and the locomotive will then operate over about 3500 feet, hauling 400 cars per day from the head of the rock tunnel at *L*.

The electric pump is situated in the workings off the branch *I*. It is a standard duplex double-acting piston Knowles pump, operated by a General Electric motor, and has a capacity of 300 gallons of water against a 40-foot head. The piston speed is constant, and should the water fall below the mouth of the suction pipe the pump does not race. This pump has been in operatiou for more than a year, working twenty-three hours a day. It requires no attention, except at starting and stopping, and an occasional oiliug.

The General Electric rotary coal drills are also in the southeast workings of the mine. These are run from a circuit taken from that connected with the feeders in the main gangway. The length of this is about 1400 feet. The drills are working a three-foot seam of coal and taking up two feet slate bottom. They make about six feet per minute, with au iuch and a half bit, in the coal, and four feet per minute in slate or "boney."

Since this electric plant was started it has operated without hitch or accident. Its installation has induced a decided economy in the operatiou of the mine, and is exciting considerable interest among coal operators, to whom is stands as an object lesson in the economical operation of mines.

The Hale and Norcross Decision.

(*Continued from page 87.*)

these reasons I think the directors other than Levy are entitled to a new trial of the whole issue.

Objection is made to the right of the plaintiff Fox to maintain the action upon the ground that the findings and evidence show that he made himself a stockholder after the occurrence of the injuries complained of, for the express purpose of bringing this action; that he acquired but a small amount of stock at that time, and that he never had any substantial interest in the corporation at any time.

The finding of the Court is, however, that he was at all times a stockholder, and as this finding is not attacked in the specifi ations of grounds in tbe statement on motion for a new trial we cannot look at the evidence; and in construing the finding we must hold that it means that he was a stockholder in a substantial sense.

Objection is made to the form of the judgment or judgments, upon various grounds, but these are objections which should have been made to the complaint on tbe ground of misjoinder, etc. I think the objectiou to the several judgments on account of their mere form comes too late. In form they follow the complaint, and if the several judgments had been for the respective amounts for which the defendants were liable, the form in which they were entered would have afforded no substantial ground of complaint.

In view of these conclusions upon the main points in controversy, most of the other assignments of error became immaterial, and, so far as the points not herein particularly discussed seem likely to arise upon a new trial, I see no substantial error calling for discussion.

To summarize the above views my conclusion is that the record sustains, or fails to sustain, the finding and conclusions of the Superior Court in the following particulars:

First—That the defendants, Hayward, Hobart and Levy, formed a fraudulent combination and agreement for mining and milling the ores of the Hale & Norcross Silver Mining Company, but that the other directors of the mining company were not parties to this agreement, but were merely negligent in the performance of their duties, and are therefore chargeable with only such negligence, and are not chargeable with any actual fraud.

Second—That the Mexican and Nevada mills were under the control of Hayward, Hobart and the Nevada Mining and Milling Company, but it is not shown that the Nevada mill was under their control.

Third—That Hayward, Hobart and Levy, with the acquiescence and consent of the officers of the Hale & Norcross Company, controlled the affairs of that company.

Fourth—That Hayward, Hobart and Levy, in pursuance of their agreement aforesaid, caused a quantity of inferior and worthless ores to he extracted from the mine, and to be milled after being mixed with ores of a higher grade.

Fifth—That the Hale & Norcross Company paid $7 per ton for milling said ores; that the actual cost of milling the same was but $4.50 per ton; that by reason of their fraud aforesaid the said defendants were entitled to receive only the actual cost of milling said ores; that by reason of having been required to pay $7 per ton for milling said ores, the Hale & Norcross Company has sustained damage in the amount of $210,197.50.

Sixth—That the evidence is insufficient to sustain tbe finding of the court that the Hale & Norcross Company sustained damage by reason of the imperfect milling of the ores in the amount of $789,618, and that the actual amount of damage sustained thereby cannot be determined from the findings of the court.

Seventh—That the Nevada Mill and Mining Company, not having been served with process, was not before the court as a defendant.

The cause is, therefore, remanded to the Superior Court with the following directions, viz.: The judgment appealed from is set aside and the Superior Court is directed to enter a judgment as of the date of its former judgment, against Alvinza Hayward and H. M. Levy for the sum of $210,197.50, with interest from that date, upon the issue presented by the claim for having paid an excessive price for milling the ore in the Mexican and Nevada mills, and upon that issue the order denying a new trial as to these appellants is affirmed. As to the other appellants, except the Nevada Mill and Mining Company, the order denying a new trial as to this issue is reversed, and a new trial thereon ordered. Upon the issue presented by the claims for damages sustained by reason of the imperfect and fraudulent milling, the order denying a new trial is set aside as to all the appellants, and the court is directed, upon the evidence already taken in the case, and such other evidence as may be presented by either party, to make findings in accordance with the views hereinbefore expressed. Upon the amount, if any, of such damage sustained by the Hale & Norcross Company, in addition to finding the value of the ore delivered to the mills, the court is directed to find the amount and value of the bullion that should have been returned therefor. The court should also find what amount of this value of the ore delivered to the mills was necessarily lost in the working, or would not under fair milling be separated from the baser matter; and also the amount of money, if any, received by the mills from the working or sale of the tailings or residue of the ores.

Until the Nevada Mill and Mining Company has been brought before the court, the court will make no trial of the issues against that company. BEATTY, C. J.

We concur:

HARRISON, J.
VAN FLEET, J.
HENSHAW, J.
TEMPLE, J.
McFARLAND, J.

Justice Garoutte concurred as follows:

I concur in that portion of the judgment which is affirmed; but dissent from the opinion of the Court wherein it is held that the evidence is sufficient to support the finding of fact to the effect that 74.6 per cent of the car sample assay is a fair return to the Hale & Norcross Company.

This actual return to this mining company by the milling company was but 52 per cent of tbe car sample assay. This was not enough. No argument or citation of facts is necessary to prove it. Everybody knows it. But the all-important question is: How much bullion in excess of this 52 per cent should have been returned to the mining company under the evidence found in this record? There is the rub. Mr. Lyman, superintendent of the Consolidated Virginia mine, and one of the principal witnesses for the defense, stated that he would hope to get a return of 65 per cent of the car sample assay. And if I had been the trial Judge upon this and other evidence introduced I should have recognized the justice of a return to the mining company to that amount at least. But the true rule to be invoked by a Justice of this court in determining the sufficiency of the evidence to support a finding of fact made by a trial court is not what such Justice would have done upon the evidence, if sitting as a trial Judge, but, rather, is there a substantial conflict in the evidence? And the question of the presence of a substantial conflict is in no way dependent upon the great number of witnesses upon the one side and the limited number upon the other, for it is often the case that one shall prevail against the many. For the foregoing reasons and many others unnecessary to detail in a case like this the finding of a fact by a trial court should not be set aside without the soundest and most convincing reasons. The opposite conclusion should be so plain that a mere statement of the evidence would indicate it. It should not be necessary to resort to an elaborate and complex analysis of the evidence in detail to prove it.

The witness Holden testifies that the mining company should have had a return of 85 per cent upon the basis of the pulp sample assay. If we allow a variation of ten per cent between the car sample assay and the pulp sample assay, then, under the testimony, there should have been a return to the mining company of about 76.5 per cent of the car sample assay. It is attempted to reduce this percentage by a claim of allowance or discount for moisture and evaporation. There appears to have been but little importance attached to this question of moisture during the progress of the trial, and all indications point to it as somewhat of an afterthought. But, however that may be, I think slight reduction would satisfy its claims, and in view of this testimany, taken in connection with that of Mr. Mackay and others, I think there is sufficient evidence in the record to support the finding which the majority of the Court hold to be without support.

Near the Equator.

W. H. Adams, of Grass Valley, has a letter from his brother, Jas. B. Adams, who with three or four companions are working for the Playa de Ora Mining Co., in Ecuador, S. A., 200 miles back from the seacoast. The mine is three degrees from the equator, and they suffer the discomforts of heat, tornadoes and insect pests. At times the rainfall reaches teu inches in an hour, the streams rising twenty feet within a short space of time. The insects are prodigious in size and continuous in their operations. Vampire bats stealthily alight upon a person in deep slumber, inserting their beaks and gorge themselves with his life blood. There is also miasma in the atmosphere, and fever prevails. Nothing but liberal salaries could tempt civilized people to remain under all of these discomforting conditions. The miuing operatious are superintended by educated and experienced white men, while the heavy manual labor is done by the natives at very low wages. Besides Mr. Adams, Edwin Ryan of North Bloomfield is foreman at the Playa de Ora. Wm. Daws of Nevada City is located at another mine, three miles distant. Mr. Blodgett, a former foreman of the mine, is on the way home to Nevada City. Five miners from Sierra county have lately arrived in the same country. The ore taken from the Playa de Ora is very rich and pays the owuers large dividends.

C. W. BALDRIDGE tells the people of Humboldt county that if they will give him $500,000 county bonds, drawing five per cent interest and running twenty years, the Cal., Oregon and Idaho Railway Company will build a standard-gauge road from Eureka to Red Bluff in three years' time. The project is favorably received.

THERE was a strike at Trail Creek, B. C., last week for an advance of wages from $3 to $3 50, but after two days the miners resumed work at the former figure. A Miners' Union recently formed has a present membership of 275.

Coast Industrial Notes.

—Birce, Smart & Co., of Emigrant Gap, have a contract to furnish 500,000 feet of lumber to the Electric Power Company of Nevada City.

—Local capitalists contemplate the generation of electric power by water from the debris dam proposed to be built by the Government at Deguirre Point near Marysville.

—San Bernardino now has three furniture factories that will soon turn out ten carloads of furniture a month. The wood used by these factories is native mountain pine.

—The steamer Columbia, improved and refitted at an expense of over $200,000, has left the dock at the Union Iron Works, and will shortly resume transit on the northern route.

—George B. Kerper, owner of the San Diego Cable Railway, is credited with intention to change the system to electricity and extend the line four miles to National City, making the total length eight miles.

—The Monrovia Electrical Power Company has ordered a steel pressure pipe and a water wheel of 100-horse power capacity, and other necessary machinery. A wire will be run to Arcadia, and, possibly, to Duarte.

—The American Power and Tide Wheel Company has incorporated; capital stock, $900,000; actually subscribed, $1000. Directors—C. Boone, M. S. Leve, A. H. St. Marie, R. M. Clements of this city and D. E. Alexander of Sacramento.

—The State Bureau of Highway Commissioners expects to be ready to deliver crushed rock from Folsom within ninety days at 67½ cents per cubic yard, delivered on the cars at Sacramento. The present price of crushed rock is $2.95 per cubic yard.

—Among unique "coast industries" may be mentioned the tarantula traffic. A Pasadena paper says over 50,000 tarantulas were shipped from that place last year to meet tbe demand of the tourist traveler, and it is estimated that in the last five years over 200,000 spiders have been sold.

—Salt Lake men want the S. P. Co. to withdraw the California–Utah freight rates of the 1st inst., claiming that Ogden is favored thereby. The company claims that the Rio Grande Western and the U. P. are the ones blamable, and that the new rates are based on the desire to give California an equal show with Eastern shippers to Utah.

—The Oaxaca Coffee Plantation Company has organized; capital stock, $500,000; $140,000 subscribed; to grow coffee and other tropical products in the State of Oaxaca, Mexico, and purchase and operate a line of vessels. Incorporators—R. Pacheco, C. Halla, O. D. Greene, H. Hume, C. W. Kohlsaat, W. J. Russell, Eli Murray and L. R. Ellert.

—Work has been temporarily suspended on the Columbia River and Red Mountain road from Northport, Wash., to the Trail Creek mines, B. C., 14 miles, owing to a decision of the General Land Commissioner, which prohibits the road from crossing the Colville Indian reservation. The road has been completed to a point on the border of the reservation.

—One of the largest water systems in the State is in process of completion at Hemet, San Diego Co., where forty men are finishing a dam at an elevation of 4500 feet. It has cost, so far, $500,000. The dam is 150 feet in height, built of granite, and covers 720 acres with 100 feet of water, which is piped and flumed twenty miles under a pressure at Hemet of 95 lbs. to the inch.

—Active work has begun on tbe little line of railroad from Alviso, or "New Chicago," to San Jose, giviug a new line of travel from this city to the heart of Santa Clara Co. The chief present difficulty is the short-sighted action of some property owners most directly benefited thereby who want the company to pay them exorbitant right-of-way privileges which will make land valuable that is now comparatively valueless.

—When completed Arizona will have the largest reservoir in the world. The proposition is to dam the waters of the Gila river to a height of 200 feet on the face, in a high box canyon, which would be the means of impounding the water back for a distance of twenty miles. It is estimated that by this means sufficient water can be obtained to irrigate most of Pinal county, comprising several hundreds of thousands of acres. The estimated cost of construction is $2,000,000.

—The Los Angeles oil industry is assuming great proportions A new strike has been made in the city of Los Angeles of green oil on a paraffine base of a 28 gravity, the ordinary petroleum being 15, at a depth that indicates enormous deposits in the third sand stratum. It is now proposed in this city to bring Southern California oil here for use as fuel. A fleet of tank ships carrying crude oil from San Pedro to San Francisco would be a novelty, hut is a commercial possibility. It would seriously interfere with the coal importation business and necessitate in many manufacturing establishments a complete change in boiler furnace grates, etc. The idea is being actively discussed. It is a question of supply and demand, and if it be demonstrated that crude oil for fuel can be furnished the San Francisco manufacturer cheaper than coal, the change will be made, and will revolutionize present conditions and methods around the bay.

—J. B. Gorman, the United States consular representative at Matamoras, Mexico, reports a prosperous condition of affairs at that point in his report to the State Department. He says there has been a rapid growth of the commercial relations of Mexico with the United States. Crops of all kinds are more abundant than they have been for six years, while manufacturing has increased in every line. He also reports a marked increase in exports, due to the new tariff. Among the articles in which there was the greatest activity were wool, cattle and hides, and large advances in prices were realized. Mr. Gorman states that only about 26 per cent of the imported goods sold in Matamoras last year came from Europe, the remainder being received from the United States. The exports of fruit were largely increased in consequence of the Florida freeze. He thinks that a line of fast steamers on the gulf would soon bring the gulf coast of Mexico into permanent competition with Florida. Mr. Gorman also says the improvement of Aransas Pass will result in vast benefit to Mexico and southwest Texas.

—The Nevada County Narrow Gauge Railroad has thirty-two miles of road from Colfax to Nevada City. There are heavy grades and sharp curves, and the road makes eleven complete circles. Teams freight from Marysville for 25 cents a hundred. Before the railroad was built teams charged 50 cents. The railroad has to meet this competition. Some years ago four-horse teams could not be hired for less than $8 a day. Now they are satisfied with $3.50 or $4. Feed is cheap and teamsters are satisfied with making a bare living. Some people going to Grass Valley or Nevada City go to Auburn on the Central Pacific and from there travel by team. They save the fare between Auburn and Colfax, and from Colfax over the narrow gauge. The distance is much shorter by wagon road, and owing to the heavy grades and sharp curves, the teams make about as good time as can be made on the railroad. If the road was twice its length it would be a paying investment. In that case the teams would not be a competing factor. The original cost of the road was $500,000. Over $100,000 have been added since in improvements. The freight and passenger rates are one-half what their charter allows them to charge, being regulated entirely by the opposition freight lines and stages which ply between Grass Valley and Auburn, Colfax and Marysville.

Scientific Progress.

The Universal Force.

By Henry Raymond Rogers.

No object in the whole universe is more familiar to the eye of man than the sun, and at the same time there is none more deceptive and misleading, for it is not what it appears to be. Its heat and dazzle are mere superficial appearances. The evidences against our present system are abundant and clear.

Science to-day asserts and demonstrably proves to be true that the universal space in which the sun, moon and stars unceasingly revolve is inconceivably cold and dark—the black of infinite space. Science also asserts that sun heat and sun light are due to the same causes and subject to the same laws. Thus sun light diminishes in the direction of the sun in the same ratio as sun heat.

The sun, surrounded by such cold and darkness, cannot emit, or radiate, a single ray of actual heat or light. The sun, therefore, can send forth no dazzle. Then what is this dazzling brightness which appears so real, and which is so largely due to the sun's action? There is an explanation that is clear and satisfactory. Mighty currents of force come from the sun invisible and free through the 93,000,000 miles of cold and darkness of space, and awaken our atmosphere to heat, light and power. These currents pass through the void of space instantaneously and incessantly and do not manifest either heat or light until they come into conflict with our atmosphere. Through the resistance offered to the progress of those currents by the atmospheric mass both currents and atmosphere become aroused to activity and heat, light and power thereby become developed.

But where, it may be asked, is located the dazzle? But one explanation of this phenomenon is possible. That delicate but powerful little optical instrument, the eye, offers the only solution of this problem. The light thrown upon this subject by that little body now clears up this mystery and reveals the magnitude of former errors.

The eye is composed of a convex cornea, which, together with the iris and the contained aqueous humor, constitute a concavo-convex lens, through the action of which the sun's rays become converged toward the pupil and increased in power. At the pupil these rays fall upon the double convex crystalline lens and become intensified on their passage through it. From thence they pass through the concavo-convex vitreous body or lens and become diverged and distributed over the surface of the retina, with dazzling, blinding effects. Thus, in the depths of the eye, this dazzling brilliancy becomes developed, and not at the sun itself, not in the 93,000,000 miles of darkness of space, neither in our atmosphere. Out of the foregoing explanation of the sun's dazzle a whole philosophy of the sun and of the universe may be evolved. From its lessons we learn that the sun may be cool, dark and habitable, and the abode of life, intelligence and beauty, and yet the earth may be heated and lighted the same as now.

A cool, dark, habitable sun! What momentous words. What power and significance are embodied in this fact or principle of a cold, dark, habitable sun. But this lesson is lost upon science since it fails to recognize in such a sun one of the grandest of the sources of the universal energy. This principle, therefore, is revolutionary.

But what are those mysterious sun currents which we have found actually to issue from such a cold, dark, habitable sun, and which develop warmth in our atmosphere, turn our darkness into light, and dazzle the eye of the beholder?

The sun has its secrets, yet its secrets are simple, exceedingly simple. Its grandest secret is embodied in a single word, viz., *motion*.

The sun and stars were set in motion by some inscrutable process, and they have continued to move onward with their initial velocity, magnitude and power. The rule of science for estimating the power embodied in a mass of matter in motion is to multiply its weight in pounds by its velocity in feet per second. This law applies alike to worlds and cannon balls. The power of the sun and stars is thus determined by their mass and their velocities. Thus the earth's mass consists of 250,000,000,000 cubic miles of matter, moving with an axial velocity of 25,000 miles per day, and an orbital velocity of 1,500,000 miles per day, while the sun's mass is 1,250,000 times greater than the earth and moves with a velocity of rotation of 100,000 miles per day. What stupendousness of power is here represented. The universal force is thus abundantly accounted for in the energy of celestial motion. The sun, isolated in space and motionless, would possess no more power than a microbe. Then whence its energies? The earth is a magnet with a magnetic axis and poles. Inferentially the sun and all stars are magnets polarized in immensity. Thus the sun and all stars work electrically. The universal force, therefore, is demonstrably electrical. If the power of a magnet be judged by its dimensions, what electrical power must be embodied in the starry universe when a terrestrial magnet, constructed of two cannons, is found capable of holding up a mass of matter weighing five tons! Again, what stupendousness of magnetic power exists in the starry host.

But electricity is not a self-existent entity. In order to perform work it must be developed as required. It acts, passes on, and must be incessantly renewed when operating on the scale of the universe, the same as in the scale of the laboratory. It is a law of electrical action that when two bodies revolve on their axis near each other electrical currents become developed and pass from one to the other. This law acts on the scale of the universe in identically the same manner as on the lesser scale. The sun and earth, whirling with infinite velocity in space, develop electrical currents which pass to and fro between those bodies in a great cosmical circuit. Thus the sun and earth and all star worlds are actually vast electrical machines or dynamos. The sun and earth thus become harnessed together and work together in harmony through the medium of a great terra-solar circuit. The stars, too, thus work together. All worlds are as one, all force is one, all life is one, all nature a unit.

So far as electrical action is concerned, space and distance become annihilated, and the stars are as if standing side by side. The most genial influences of the sun, as well as the most stupendous electrical powers, are in operation at Neptune, 2,800,000,000 miles distant, as effectually as at Mercury or the earth. The gentle but positive character of the universal electrical force is seen in the fact that a current may be transmitted across the ocean through the medium of a wire simply by employing a percussion cap and a tear for a battery.

Upon the action of the currents of the terra-solar circuit depends all physical phenomena of the earth—its heat, light and dazzle, its gravitative and chemical actions, etc. In the words of Wm. H. Preece, the distinguished electrician of London, "All physical phenomena, every form of force, without a single exception, may be traced to the mere transformation of the electrical energy."

To briefly sum up our study of the nature, the cause and the teachings of the sun's dazzle, we may say that this same universal electrical energy, product of the tremendous motions of the heavenly bodies, the universal electrical energy whose existence was not even suspected prior to the present generation, is working toward the radical revolution in human thought and science and philosophy. Through this great revolution the sun of the past ages, the sun of our fathers, *i. e.*, the raging ocean of gas and fire and flame of present science, is fast giving place to a real sun, made on a grander plan, and whose operations are not after the analogy of the torchlights and heating furnaces of poor human contrivance.

The electrical energy of celestial motions is the universal force, and henceforth must be accepted as both interpreter and interpretation of the manifold phenomena that heretofore have stood as confused and unrelated facts outside of any perfect system of cosmical science.

A curious experiment with an alloy of copper and aluminum has been reported to the Paris Academy of Sciences by M. Le Chatelier. Equal parts of aluminum and copper were, it is said, fused together in a crucible. The resulting ingot was then placed for twenty-four hours in a solution of common salt and chloride, with a view to dissolving out the uncombined aluminum. No apparent change could, at the end of that time, be observed in the ingot. It was accordingly removed from the saline bath, washed and dried. At the end of twelve hours the whole mass was found to be reduced to a state of powder from the spontaneous oxidation of the alloy. A similar ingot, not immersed in the solution of sodium and lead chlorides was unchanged at the end of a month.

The French chemist Berthelot has made alcohol by an entirely new process, which gives a perfectly pure product and consequently less deleterious to the health. He sends a current of hydrogen gas through the flame of an electric arc formed between carbon rods. This produces acetylene, which combines with nascent hydrogen and yields ethylene. The last mentioned hydrocarbon, absorbed in sulphuric acid, makes sulphovinic acid; and mixture and boiling with water finally produces alcohol.

Mechanical Progress.

New York's New Suspension Bridge.

The suspension bridge project for the Hudson at New York assumes the use of no fewer than six tracks. The older New York and Brooklyn structure is in reality two bridges hung side by side and braced together, the promenade being an extra weight on the interior cables. It has a fifteen and five-eighths inches cable on each side; in the estimates for the new work a cable of twenty-one and one-half inches diameter is spoken of. These supporting cables of long bridges are made of steel, and are either chains composed of connected links, or are formed of parallel wires or twisted wire rope. To obtain the widest span possible, the weight of the cable must be a minimum as compared with its carrying capacity. Steel in the form of wire has a minimum strength more than double its maximum strength in the form of bars that would be suitable for the construction of a suspension chain. A wire cable can be stretched about two and one-half times as far as a steel chain before being broken, under like conditions. The cables of the Brooklyn bridge have 5400 wires in them. The cables of the Cincinnati bridge have a diameter of twelve inches, and each contains 5200 No. 9 wires. There is a practical limit to the number of wires that can be united in a cable. The number suggested for the Hudson bridge is 6000 parallel steel wires, No. 3 gauge.

The *Engineering News* noted recently a striking example of the accuracy of American tools and workmanship in the case of the twelve-inch guns going from Watervliet arsenal to the proving grounds at Sandy Hook. Each of these guns is forty feet long and weighs 115,000 pounds, yet the difference in weight between the seven guns is said to be only five pounds. These guns are nickel steel tube army rifles of forty calibers in length, instead of the usual thirty-five calibers. Instead of a jacket a series of hoops are shrunk on the inner tube for nearly the whole length of the gun, and over this is shrunk a single jacket, covering about two-thirds of the length, and then another layer of long hoops. When the intricacy of this assembling process is considered in connection with work done on lathes capable of handling guns forty feet long, the close agreement in weight is almost phenomenal.

The air injected into the pneumatic chambers of the Third avenue bridge across the Harlem river, New York, is heated to so high a degree by the work of compression that, particularly in hot weather, it becomes unsuitable to work in, and has been noted at 104° in the working chamber where the workmen were stripped to the waist. To remedy the trouble Messrs. Arthur McMullin & Co., the contractors, have applied a cooling device that is very simple and satisfactory. The four-inch pressure pipe which delivers from the receiver into the caisson enters a tank, and terminates in a header tapped on a side to receive 16 one-inch pipes, which, with elbows and return bends, form a large compact coil connected at the extremity with another four-inch header, which emerges from the tank and is continued as the regular supply to the caisson. City water is supplied to the tank, and flows through it to the suction of the boiler feed-pumps and feed-water heater. The air supply is thus made cool and comfortable, some heat units are saved for the boiler feed, and the regular water supply is utilized without extra cost.

It is thought that there will soon be important changes in the mode and means of newspaper making. The reporter will send both description and picture by telautograph, and the reporter of the future is going to draw as well as to write. The editor, whether in his office or temporarily residing at a distant point, will telautograph his orders and his ideas, and, by an improvement now being perfected, he will receive telautographic proofs in return. Writers on newspapers will become users of a machine in process of construction by which the present typewriter keyboard will not only set their ideas into print, but will also instantaneously put them into type, eliminating the machine typesetter as the machine itself has eliminated the hand compositor, and as the steam press eliminated the hand press. These are only a few of the changes in the near future of journalism. These and others bound to come will not injure any one, but will divert to other profitable fields labor now occupied immediately between the writer and the press.

The ball nozzle which has excited so much interest throughout the country is intended to work a radical change in the system of fighting fire. Instead of working at a distance with straight streams, firemen, by using the ball nozzle, can enter burning buildings and work at close range, thus not only doing more effective work, but averting to a considerable extent the serious damage to interior property, and in many cases this system will enable firemen to save the lives of inmates of burning buildings.

It has been found by means of magnetic observations that an enormous bed of iron ore underlies the city of Moscow and the surrounding country. But it is apparently at a depth of nearly 35,000 feet, or about six or seven miles, and is is therefore beyond reach. It is of the magnetic variety, which fact accounts for this interesting though tardy discovery.

Hiram S. Maxim recommends the adoption by engineers of a standard of the loudness of sound, comparable to the candle as a unit of light intensity. Thus, he thinks, it could be ascertained whether machinery in a building made more racket than street traffic. He would employ a phonograph in making such tests.

Celluloid, a composition of gun-cotton and camphor, is highly inflammable usually. But a fireproof variety of it has been invented in England. It makes admirable stereotypes, and it gives as good a duplicate as electrotyping and at less cost.

Electrical Progress.

Causes of Atmospheric Electricity.

Although the occasional lightning and, in these latitudes, still rarer aurora borealis are almost the only manifestations of atmospheric electricity with which the majority of people are familiar, it is known to scientists that the air is everywhere, at a certain level above the earth, charged with this mysterious force. The aerial envelope of our globe is a veritable storage battery of enormous dimensions. More than a score of causes have been supposed to be at work supplying the reservoir with electricity, two of the most conspicuous and noted being evaporation and the beating of the waves upon the rocks. Apropos of the recent researches of Lord Kelvin and others into this latter phenomenon, Prince Krapotkine reminds the readers of the *Fortnightly Review* that Plante and Palmieri regarded atmospheric electricity as an agent liable to cause as extensive and violent movements of the air as differences in temperature. It is possible that weather science may be entirely reorganized on this basis some day. Professor J. J. Thompson, of Cambridge University, believes that the process of generation when water splashes against a rock is not altogether mechanical but partly chemical, and that some few particles of the fluid are broken up into their constituent atoms (not molecules merely). His experiments tend to strengthen the view advanced by Helmholtz and others that "electricity and chemical action are two moods of the same energy."

THE Kaweah Irrigation and Power Co. has incorporated; capital stock, all subscribed, $300,000, at Visalia, Cal. Directors—E. C. Ware, Chicago; A. G. Wishon, Tulare; G. Hanna, John A. Pirtle, Los Angeles, and O. C. Ainsworth, Pasadena, to develop and furnish power. It is intended to put up an electric power plant of 3000 H. P. capacity, power generated by water from the Kaweah river, four miles distant, brought in a ditch twenty feet wide and six feet deep, to have a perpendicular fall of 125 feet from the lower end of the ditch to the wheel. There will be a tunnel and several hundred feet of solid rock cut. It is also proposed to irrigate 40,000 acres of arable land. An ice factory, an electric railway and local manufacturing enterprises are embraced in the company's plans. Work on the ditch began this week and will be pushed to completion, as the Kaweah river is now at its lowest stage.

THE electrical engineers and the Baltimore and Ohio Railroad officials are so well satisfied with the tests made by the electrical locomotive that they say trains can now be run through the tunnel regularly by electric power. The tests were continued, and after several loaded freight trains had been hauled through to the satisfaction of those who witnessed the experiment, it was decided to put the new engine in regular service. It is the intention of the Baltimore and Ohio Company to haul all its trains through the tunnel by electric motors.

ELECTRIC FEEDER LINES have been introduced by the Pennsylvania Railroad Company, who hope thus to render branches remunerative which have hitherto been financial failures. The first of these branches to be so worked is the Mount Holly line, which is about seven miles in length. In some preliminary experiments a speed of forty-two miles per hour was obtained with a trolley car on this line, and with two standard cars attached a speed of thirty miles per hour was reached.

IN less than ten years since the introduction of electricity to street railway propulsion, there are now 976 street railway companies in this country, operating 13,588 miles of road. About $750,000,000 of capital is invested in street railroads. Application of electric power to steam roads has been successful, two examples being the branch at Nantasket Beach and the electric locomotive for the Baltimore & Ohio tunnel at Baltimore.

F. R. LEE, Commissioner of Electric Railways of Brooklyn, N. Y., has written to the San Francisco Board of Supervisors, advising the establishment in this city of a commission similar to that at Brooklyn, with jurisdiction over trolley systems, sewer, gas, steam, water and all other service pipes. Here is an excellent chance for Mayor Sutro and Supervisor King to "get together."

SACRAMENTO will have an electric carnival on the night of September 9th to celebrate, on the 45th birthday of the State, the great electric transmission scheme now in successful operation.

Practical Information.

The British Census.

Great Britain is issuing returns of the census taken on the 6th of last April. The population is shown to be: England and Wales, 30,270,817; Ireland, 4,522,982; Scotland, 4,142,471; total, 38,936,270. Thus, about half the population of the United Kingdom is comprised within 58,310 square miles, or 100,000 square miles less than the State of California.

The most remarkable feature of the census is the small increase during the past four years. According to returns made in 1891, the population of England and Wales was 29,002,525, or an increase of only 1,268,292. For Ireland it was 4,704,750, so that there has been a decrease of 181,768. Scotland had 4,025,647, an increase of only 166,824. As many of the cities have increased very largely, the depopulation must be from the rural districts.

The population of the islands is essentially British. Of the 39,000,000 inhabitants, 73.9 per cent were born in England and Wales, 10.60 in Scotland, 13.87 in Ireland, making 98.86 in 100. Of the remaining 0.114, 0.044 were born in the colonies and dependencies, 0.069 in foreign countries, and 0.01 at sea. Of the 30,000,000 inhabitants of England and Wales, there are only 207,000 who are foreigners by nationality and by birth. One out of every ten foreigners in England is a native of "the States." Nearly one-half of the 207,000 foreigners are to be found in London. Still London is not as greatly overrun by them as is popularly supposed; where they are thickest they number only about twenty-three in every 1,000 of the population. Taking the whole of England and Wales, there are not quite seven foreigners in every 1,000.

There are nearly 2,000,000 more people in the State of New York than in Scotland, and almost as many in the State of Ohio. There are more foreign-born people in the United States than the whole population of Scotland and Ireland combined. There are nearly half as many Irish-born people in this country as in Ireland. In 1890 there were nearly as many people in this country foreign-born or born of foreign parentage as the entire population of England.

The number of persons to the square mile in England is 519; Ireland, 140; Scotland, 136. In the United States it is about twenty. If the land was parcelled out each Englishman would get one and one-quarter acres; in the United States about thirty-two acres.

Grouping the whole population, without regard to age, we find that out of every 100 people, 48½ are males. Taking the same number of both sexes under 20 years of age, the census shows that 49¾ are males. Taking those over 20 years of age, the greatest difference between the sexes is 52½ women to 47½ men in every 100 of the adult population. That is, there are just 1060 females to 1000 males. Taking the ages 25 and older, there are 1116 females to every 1000 males; for 65 and older there are 1246 females to 1000 males. The proportion in the United States is: Male, 32,067,880; female, 30,554,370.

North Pole by Balloon.

M. Andre has received the sanction of the Swedish Scientific Society to his balloon project in search of the North Pole, and has received a liberal donation to help defray expenses from King Oscar of Sweden. Sufficient funds have been obtained, and the attempt is assured, and M. Andre now desires the approval of the International Geographical Congress.

M. Yon of Paris has entered into a contract to make the machine of double silk, of which about 5000 cubic meters will be required, the cost being $12,000. The balloon is to be capable of carrying three persons, with the necessary instruments and ballast. It will be sufficiently gas-tight to hover in the air for thirty days at a height of 250 meters. M. Andre calculates that from 1700 to 1800 cylinders filled with gas under the pressure of 200 atmospheres will be required for the expedition in order to refill the balloon from time to time. He believes he will be able to guide the machine by a system of sails acting as a brake if needed.

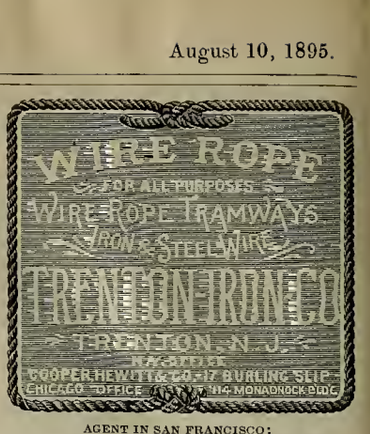
The car is to be spacious enough to contain a sledge, a sailing boat, several weapons, with ammunition, and a photographic camera. Early next spring it is proposed to erect a balloon-house, and, after filling the balloon, they will start on the voyage for the pole in July, '96, with a fresh south or nearly south wind. The duration of the voyage must, of course, largely depend on the strength of the wind. It might possibly only last five or six hours, but M. Andre expects that it will take at least over forty. Thirty days, he believes, will suffice for cruising about the central polar basin and taking a complete survey of it.

The return journey is to be made toward the inhabited parts of North America and north Siberia. With a wind of average velocity, M. Andre says the balloon can make 19,500 kilometers in thirty days, whereas the distance from Spitzbergen to the Behring straits via the pole is only 3700.

Dr. H. Wichman of Gotha, one of the most eminent German geographers, in commenting on the subject, says: "The execution of this bold enterprise may, of course, be influenced by many unforeseen contingencies. The project is by no means a fanatical one, but has been maturely and cautiously worked out in the light of science. This is best proved by the fact that Dr. Elkholm, the eminent meteorologist, who was in charge of the Swedish observatory in Spitzbergen in 1882 and 1883, has announced he will take part in the expedition."

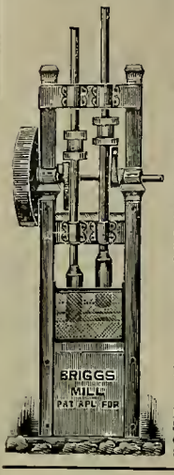
THE new law in regard to the maintenance of secrecy by telephone employes as to messages passing over the wires goes into effect on the first of next month. It requires the staff of telephone companies to be as secretive regarding the nature of their business as are the men and women who handle telegraphic messages. A person who either wrongfully obtains or attempts to obtain any knowledge of a telegraphic or telephonic message by connivance with a clerk, operator, messenger or other employe of a telegraph or telephone company, or, being such operator or other employe, willfully divulges to any but the person for whom it was intended the contents or the nature of a telegraphic or telephonic message intrusted to him for transmission or delivery, or of which contents he may have in any way have become possessed, is punishable by a fine of $1000 or six months' imprisonment, or both. The same penalty attaches to neglect or refusal to transmit or deliver messages, except when they are intended for illegal purposes.

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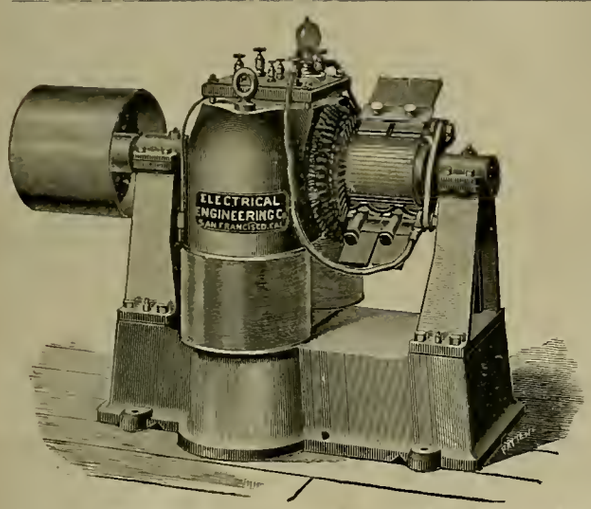


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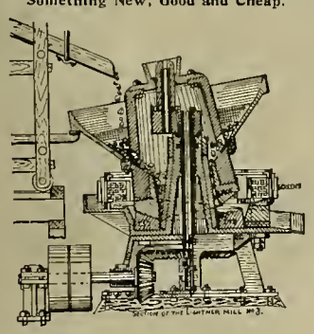
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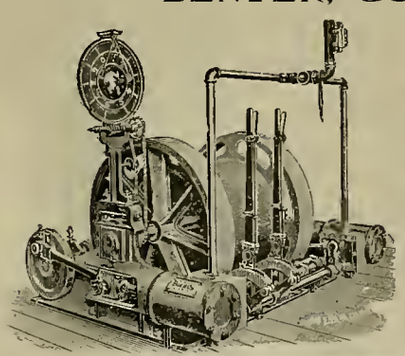
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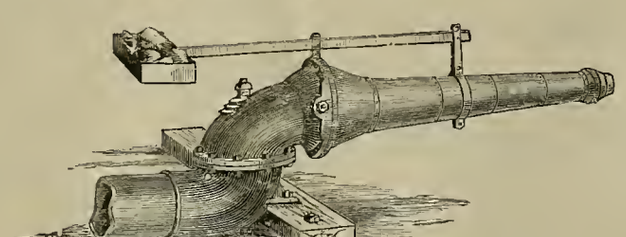
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Mining Summary.

CALIFORNIA.

Alameda.

A MANGANESE CLAIM.—William Hirst filed a miner's claim to a belt of manganese ore 1500x600 feet in the southern portion of this county, near Livermore—the first miner's claim recorded for many montbs.

Amador.

INCREASED ACTIVITY.—*Record:* Recent developments made in the Aneta and Alma mines at Jackson indicate that those properties are to prove successful and paying ventures. The South Eureka Company are pushing ahead work on a twenty-stamp mill, and when completed the mine is expected to make an excellent showing in the way of production. The Summit mine, which adjoins the South Eureka, will soon be the scene of active operations. Over Amador City way the McIntire mine is to be opened up as speedily as possible, and active work is already inaugurated there. The Median mine is yielding well and the old Keystone continues to hold its own. The resumption of work at the Gover mine is an important event, as it is believed that, with proper development, it will rank with the greatest mines on the mother lode. Alvinza Hayward evidently means business at the Hazard mine, as he is erecting buildings and machinery capable of developing the property on a big scale. The Wildman and Mahoney mines in Sutter Creek are employing a large force of men, and under the management of Superintendent Ross are in a prosperous condition. Thirty stamps are pounding away steadily at the former, and at the Mahoney au additional ten stamps were dropped yesterday.

Mariposa.

GENERAL NOTES.—*Miner:* Tbe Bardarita, which was under lease to Johu Roberts, is now shut down owing to some disagreement as to the royalty to be paid by the lessee, to P. P. Mast, the owner.

The Alice Clark mine is the present scene of much busy work. Its owner is rapidly pushing the work of tapping the ledge, from which point an upraise will be driven to the upper workings. Mr. Clark intends improving the milling facilities as soon as the work of stoping ore commences.

Captain A. H. Ward, of the Pinon Blanco group of mines, is expected back this coming week to arrange for the resumption of work on his properties.

The Merced Gold Mining Co. are busily engaged in erecting the large machinery which is to take the place of the light mechanism now employed in their hoisting plants at the Louisa, Melvina and Potosi mines. They are having an immense quantity of cord wood and timber hauled on the ground. The work of sinking the two shafts and the Potosi winze is being prosecuted with all possible dispatch. No great move has yet been made towards bringing in the ditch from Tuolumne river, from which the electric power is to be secured.

The shaft in the Tyro mine is being pushed to the 700 level as rapidly as three eight-hour shifts can do the work. The south drift on the 500 was advanced twenty feet during the week. The mill still continues idle, though as soon as sinking is over with sufficient stoping ground will be opened up to keep plenty of quartz on hand for steady crushing. During the partial cessation of work tbe machinery is being touched up a little. Superintendent John McLaughlin reports the ore bodies as looking very promising.

Merced.

PLACER MINING.—*Herald:* Mucb placer mining is going on in and about La Grange; to such an extent, in the aggregate, that the 2,000 inches of water carried in the La Grange W. and M. Co.'s ditch is pretty much all in use. Mexicans, Chinese and not a few Americans and Englishmen are engaged in the work and all seem to be making a living. Pockets are known to be found quite often, and there is no doubt that many of these discoveries are not made known. A few days ago a man engaged in mining of this description found a pocket and after taking out about $100 worth of gold went on a tour of celebration. While he was thus engaged, others cleaned up the pocket, it is reported.

Nevada.

Tidings: The West Harmony drift gravel mine continues to pour forth its golden treasures. To-day the regular clean-up was made and the result was a large bar of bullion worth several thousand dollars. It is to be regreted that this company's ground will soon be worked out, as the cessation of operations there means the laying off of about fifty employes.

At the original Harmony mine, further up the ridge, splendid gravel is being taken out, and it is expected that the next clean-up will be one of the largest ever made there.

HAVE STRUCK GOOD QUARTZ.—*Tidings:* A year ago a company of tributers leased the California mine, on the left side of Deer creek near the old Seibert place, for a term of five years. They have run a tunnel 200 feet, striking the old California ledge where it is from eight to sixteen inches wide. The quartz is of splendid quality and a crushing had recently yielded $24 per ton. The indications are that the ledge will increase in width considerably before long, in which event the tributers will have a good thing. Even with a small ledge of quartz like that last crushed they can do pretty well.

WILL PROBABLY BE SOLD.—*Transcript:* The Jeffersonian quartz ledge, near Bowman's Dam, will probably be sold soon to a New York syndicate. A gentleman representing the company will visit the mine Wednesday. Owing to the immense size of the ledge, which runs from 300 to 500 feet in width, the mine has been called the Young Alaska. The quartz carries considerable sulphurets, which assay $129 per ton, while the assay of the ore shows from $6 to $8 per ton in free gold. Gen. A. M. Dobbie, of North Bloomfield, is the present owner of the property.

BOUGHT A THIRD.—*Union:* A third interest in the Blue Lead mine at Relief Hill, belonging to the Cotton estate, has been sold to W. Cameron, J. G. Landshurg and E. Power for $825. Fine gravel was recently struck in the mine and tbe prospects are very encouraging.

NEW HOISTING WORKS.—The Cadmus Mining Company, whose property is on Deer creek, below the Providence, have begun the erection of their hoisting works. The machinery will be of a capacity sufficient to work to a dept of 2000 feet. The shaft at the mine will be vertical, instead of on an incline, as with most mines in the district.

Placer.

MINE SOLD.—*Sentinel:* The Eureka Consolidated Mining Co., of whicb Felix Chappellet is superintendent, purchased this week the Indian Springs mine from J. H. Neff and D. W. Lubeck. The claim consists of about 2000 acres and lies just ahead of the famous Red Point mine. This, with the 3600 acres already owned by the Eureka Co., will give it one of the largest, if not the largest, area of any drift mining company in the State.

Riverside.

GENERAL NOTES.—Among late locations of mining claims in Riverside county are two by J. B. Merris and W. J. Blair. Tbey have named them "Straubenmuller No. 2," and "Oro Mucho." The mines are located in the desert country.

H. D. Converse and J. A. Jordon have located a claim in the Eagle mountain district, Riverside county, about half a mile nortbeast of the Buzzard Springs, the only source of water known on that mountain. The same parties have also located a mill site at the same place and appropriated the water.

The Rosina, Hayseed and Milly mines have been located in the Menifee district by E. M. Woodberry and E. L. Platt and their location notices have been filed witb the County Recorder at Riverside.

Another rich mining strike, says the Perris Valley *Record*, is reported from tbe desert about one hundred miles east of San Bernardino. It is in the Gypsy mine in the Virginia Dale district. Tbe find is described as a five-inch streak of decomposed quartz running through a twenty-four-inch vein. Tbe solid ledge matter is said to have shown $208 to the ton in free gold wbile in some of the higher grade ore the assays are reported as bigh as as $423. Tbey are down sixty feet with a twenty-five-foot drift each way.

Work on the Ophir mine, says the Elsinore *Press*, is progressing finely. Tbere are at present about twenty-five tons of ore ready which will be taken to the Good Hope for milling. What has been already milled runs about $20 to the ton.

San Bernardino.

IT IS STILL RICH.—*Times-Index:* The trial run of the five-stamp mill just set up at the McHaney mine gives more proof of the enduring richness of the mine. Tbe mill was started Friday and in a thirty-hour run it pounded out $3400 in gold. During the run, a little over twelve tons of ore was worked up, which gives the showing of almost $300 to the ton, a value which if it holds out will soon result in running the product of the mine into hundreds of thousands.

From the start the now famous mine has been made to pay expenses, and pay its own way. A two-stamp mill was rented and gold enough taken out to pay for developing the mine, and finally for the new five-stamp mill which has just been started. Now it will be kept pounding away until gold enougb has been taken out to pay for a forty-stamp mill, which is in contemplation, and when that is in operation, if the mine continues to be so rich, one day's run of the ore will net a small fortune.

THE MORONGO KING.—A strike bas been made in the Morongo King mine, and the ore uncovered is being boisted from the 300-foot level. Tbe new strike is a seven-foot ledge; the first tbirty tons which were milled netted almost $4000.

ADDITIONAL STAMPS.—Holland & Tingman are having built a five-stamp mill near the Desert Queen mine. Five stamps are to be added to the Lost Horse mine about forty miles east of Banning.

A ten-stamp mill will shortly be put in the Keystone mine, near Vanderbilt, by Tom Williams.

TAILINGS TO BE WORKED. — *Times-Index:* Arrangements have just been completed by which 100 carloads of tailings which have accumulated at Victor will be brought to this city and worked up. H. S. Sherard, a mining engineer, and Dr. J. T. Colliver are interested in the plan, and work is to begin at once, arrangements for transportation having been completed.

The mines which are tributary to Victor have for some time been hauling down the tailings, when coming for supplies, and the tailings have accumulated until there is now 100 carloads lying at Victor. The plan of the new enterprise is to bring the ore to this city, where the plant of the West Coast Lumber Company has been secured, and they will be treated to processes for extracting the remaining gold. If the work proves to be successful, and the projectors are confident of the outcome, it will become a regular industry, and the tailings from all the mines in the district which draw supplies from Victor will be brought to this city and worked.

The first shipment of 100 cars is in the nature of an experiment, but it may lead to the establishing of a new and very important industry for this city, and may be tho precursor of smelters, whicb bave for years been the dream of local enthusiasts.

The tailings come from the mines in Holcomb valley, Bear valley, the Morongo district, and from mines through all that section of the mountains, but there is the desert to draw from, should it be profitable.

San Diego.

GREEN WINS: WHITE LOSES.—*Union:* An instrument was filed in tbe county recorder's office yesterday by which Zacharias H. Lowman of Santa Monica and Thomas Johnson of Hedges, bond a group of mines in the Cargo Muchacho district, on the desert, to Clarence S. King of Atchison, Kan. The mines are known as the Fair West, Eastern Extension, Homestake, American Girl and Black Quartz, and the option is given for one month with the privilege of six more, and at the end of that time "if the green ore overlaying the white quartz in the American Girl should be developed in paying quantities, that is, $5 or more per ton," then the price to be paid for the group by King is $120,000. If the green quartz should not be so developed, the price of the group is to be $60,000.

Santa Barbara.

ANACOPA ISLAND.—The Santa Barbara *Independent* says that John Roseigh, one of tbe discoverers and owners of the ledge of ore on Anacopa Island in the Santa Barbara channel, has certificates of assays of the ore, showing returns that will average $14 to the ton. Tbe owners of the island will continue their developments and if the mill returns continue to prove satisfactory the necessary machinery to mine the ore will be put up.

Shasta.

THE MURDOFF PROCESS.—*Free Press:* The Eureka Tellurium Gold Mining Company completed the setting of the last piece of machinery of the Murdoff process Wednesday, and on Thursday morning started the entire plant on high-grade ore. J. S. Ludlum, the secretary of tbe company, is quite confident of success, as thorough tests have been made on low-grade ore.

NEW CHLORINATION WORKS. — The new chlorination works that R. G. Hart is putting in on the Texas will have a daily capacity of a ton and a half. The proposed 2000-foot tunnel will be run when a further depth of seventy-five feet is attained.

GENERAL NOTES.—*Searchlight:* E. B. Preston, Field Assistant of the State Mineralogist, is in town on his way to Trinity county. He will return in a few weeks and examine mines and prospects in this section.

Mr. George is about to put up a pump on the Jim Blaine, and after freeing it from water proceed with development.

E. Markwick, superintendent of the Clear Creek Milling, Mining & Power Co., has increased the force to complete the dam in the ereek. When completed the water will be used for power and the bed of the creek will be worked for gold above the present site of the Igo bridge.

Supt. Tozier, of the New Brunswick mine, now being developed near the Tower House, reports work progressing favorably on that property. A tunnel 350 feet in length, designed to tap the ledge 200 feet below the present superficial works, is being run and is already nearly half completed.

Siskiyou.

GENERAL NOTES.—*Journal:* Tbe water supply for hydraulic mining is getting short, owing to the continued hot and dry weather prevailing, hence work has been stopped with the giants, wbich require a great quantity of water and heavy pressure. The miners are now cleaning up along the bedrock with the light supply, so as to finish before the ditches and small streams are completely dry.

Teamsters are busily engaged in hauling the big pumps, boilers and other machinery to McAdams creek from the Yreka R. R. depot, to be used in reopening the old Steamboat claim, noted for its richness whenever possible to get down to bedrock in pumping out tbe water. This machinery is to be used for drainage until a bedrock drain is completed.

The Black Lead mine, at Greenhorn, under the management of J. W. Scheld, bids fair to become a valuable gold-yielding claim, as the gravel at bedrock prospects very rich, and is of good quality, worth $17.40 an ounce. He has a force steadily at work hoisting out and washing gravel, aided by two steam engines, one for hoisting and another for pumping. The drainage pump is one of the old-fashioned Cornish pumps worked by a wbeel at the surface, operating a plunger reaching down to the bottom of the shaft. The water pumped out is utilized to good advantage in the sluices, for washing the gravel, wbicb supply, though not extensive at present, will be abundant to work on a larger scale when winter storms commence again.

The Espey, Hunter & Co. pump at Shasta river still continues to work nicely in throwing the water over the big hill into the flume, and as soon as the flume is soaked up to prevent leakage and the ponderous machinery gets limbered to work smoother, a full supply of water will be afforded to run small hydraulie pipes on the banks to be worked. When everything is in good working order the mammoth pumps are expeeted to raise from 125 to 150 inches of water, in supplying the flume at summit of hill north of Hawkinsville.

The Hunter & Co. ditch at Horse creek, on the lower Klamath, is completed, and water was started through the high flume during the first of the week. Piping is expected to be commenced next Monday, in getting out gold dust.

Trinity.

WORK PROGRESSING.—Twenty men are at work in the two camps on the two-mile tunnel of the La Grange Company. The work is to be prosecuted from both ends, and a shaft is to be sunk in the center so that four sbifts can work at once. This tunnel, when completed, will connect with the ditch to Stewarts Fork, and will save nine miles of ditcb digging.

M. M. Johnson, of this city, owner of the Hoboken Flat property on lower New River, has men at work digging a two-mile ditch from Bell creek, which will have a capacity of 600 inches. In addition, he is making a bedrock cut, which in some places is twenty feet deep in hard granite.

NEVADA.

ON THE COMSTOCK.—The only work done in the Savage mine during the past week was in repairing the main hoisting shaft from the 800 to 850-foot levels. This work was finished and tbe usual mining operations were resumed throughout the mine on the morning of the 5th.

SOUTHEASTERN NEVADA.—In Robinson district, in which Ely is situated, the Chinaman mine is reported developing into bonanza. There is a large body of gold-bearing ore in the mine and the company is now running a tunnel to drain it.

DeLamar is now a lively camp. The mines are producing well and gold bars are shipped every week.

YERINGTON ET AL. — James Yerington, with St. Louis men, is at Silver Star district, to look at the gold mines which were not sold to Senator Wolcott, of Colorado. Mr. Yerington tbinks there will be no doubt about a sale being made this time.

LYON COUNTY.

HAVE STARTED WORK.—Tbe Green Mining Company has started operations in Silver City under the management of D. Crosby.

A CYANIDE PLANT.—The Carson River Dredge Company will soon begin the erection of a cyanide plant to work the concentrates that are taken out of the river by the dredge.

OREGON.

TITLE TO THE VIRTUE MINE.—Judge Eakin bas rendered a decision in the case of Francis Clarno, assignee of the Virtue Mining Company, vs. George W. Grayson, involving tbe title to the Virtue mine, Baker county's heaviest producer. The decision was in favor of Grayson, the court finding that the Portland company forfeited its right of possession by failing to comply witb the contract.

ON THE UMATILLA.—Placer mining is in progress on the Umatilla river above Pendleton. The sand along the shores in that section, both on the Columbia and Umatilla, have been known to contain gold, and Cbinamen for a long time have been mining on a small scale.

STAMP MILLS FOR THE BOHEMIA MINES.—Cottage Grove reports tbat two 10-stamp mills are going into the Bobemia country this fall—one on the Star and one on the Champion mine. The Music mine is taking out $5000 per month with five stamps.

WASHINGTON.

THE MONTE CRISTO.—The Everett smelter is running to the full capacity of its roasters, with one stack now smelting eighty tons daily. The works have three stacks which can be used by increasing the roasting capacity. The Monte Cristo mine, sixty miles from Everett, in the Cascade mountains, is sending 1000 tons of concentrates per montb. The ore is iron, carrying gold, and is low grade. On the surface it was considered a lead proposition, but with development the ore has changed. None of the other properties in tbat district are being worked.

THE TACOMA SMELTER.—The following is furnished by the Tacoma Chamber of Commerce, being a statement of operations of the Tacoma Smelting and Refining Co. for the month of July, 1895: Number of men employed 63; pay roll $4510.31, woodchoppers and teams $996, total $5506.31. Product—2000 bars bullion, weighing 204,704 lbs., containing: 1175.45 ozs. gold ($20.67) $24,296.55, 32,056.55 ozs. silver (.66¼) $21,317.60, 202,423 lbs. lead (.03¼) $6578.75, total $52,192.90.

BRITISH COLUMBIA.

NEW MINING DISTRICT.—A new mining district on the Salmon river is attracting the attention and investigation of prospectors and capitalists. Tbe district can be reached either from Waneta, at the mouth of the Pend d'Oreille, or from Salmon siding. Botb places are on the Spokane & Northern.

SEND THE NEWS TO LAMOUREUX.—A Victoria, B. C., dispatch says: The Supreme Court, five Justices sitting, decided the case of W. H. Bainbridge vs. the Esquimalt and Nanaimo Railway, involving the ownership of precious metals in railway lands on Vancouver Island, in favor of the plaintiff. All the Justices agreed that the land grant did not carry with it precious metals, and laid down the principle that if it is desired to do so in future grants they must be specifically mentioned in the grant. The Dunsmuirs will appeal to the Privy Council. The suit involved the ownership of all the gold, silver and quicksilver claims in the railway belt.

ALASKA.

JUNEAU MINING CO.—Hayward and Lane, of the Juneau Mining Company, who have lately erected a 30-stamp mill, have ore which runs from $1 to $14 per ton. The cost of mining and milling is calculated at from $1.50 to $2 per ton.

IDAHO.

THE COMET MINE.—The Comet gold mine, on Deer creek, near Soldier, on Camas prairie, has been bonded to a party of Salt Lake men, who have agreed to ereet a mill thereon to test the value of the ore and to do other development work.

THE LAST CHANCE.—Wallace *Miner:* Charles Sweeney is baek at his old position as superintendent of the Last Chance mine. They have thirty-five men at work, which is all they can use at present, and have not the slightest difficulty it getting all the miners they need. They are already breaking down ore. They are running the mill on one shift

for the present, but will commence next week to run it on two shifts. They are now working from the lower tunnel, but will also commence in the upper workings shortly.

WILL PUT IN A FIVE STAMP MILL.—O. H. Thompson, at the old Pierce City district in northern Idaho, has bonded the Best Chance group of mining claims for $40,000, and will immediately put in a five-stamp mill, estimated to cost $8000. The pay streak is from one to four feet, and continues the full length of six claims. There is a 110-foot tunnel to the ledge, showing it up at thirty feet of depth.

MONTANA.

BELL CONSOLIDATED MINING CO.—This property was secured some time ago by Col. R. A. Hawkins, of Helena, and organized into a stock company with a cash capital of $300,000. The property is six miles from Townsend and consists of three locations all on the same vein. Work is now progressing on the Bell mine. They have a shaft down 80 feet, in the bottom of which, it is claimed, there is six feet of concentrating ore, running from 60 to 180 ounces in silver and 60 per cent lead, besides a small streak of gold. It is the intention, within the next month, to equip the property with a steam hoist, and put up such other machinery and buildings as may be necessary to properly work and develop the property extensively. The Bell vein crops strongly on the surface, and can be easily traced throughout the entire length of the three claims.

REPORTED SALE.—A New York paper of the 7th says it is reported there that W. Hamilton Smith "concluded negotiations for the purchase of a controlling interest in the Anaconda mine." The report is very improbable.

WYOMING.

A GOLD STRIKE.—A strike was made by the Pennsylvania Mining Company at Seminole last Saturday, where in a new shaft an eighteen-inch vein of free-milling gold ore was struck.

FOUR-MILE PLACER GOLD.—*Laramie Republican*: Judge Scott and T. B. Hicks, who returned from the Lewiston mines this morning, met Mr. J. C. Davis at Rawlins, who exhibited to them a bottle of placer gold valued at $380, which was fine in size and quality, says the *Sun-Ledger*. It came from the gold deposits now being operated by the Rock Springs Mining Company at Four-Mile, in which Mr. Davis is a large stockholder, and was obtained by working over the concentrates of black sand and gold.

The company has already taken out about $15,000, and it is estimated that the proceeds from the company's property this season will be $40,000. A large number of companies are operating in the Four-Mile district, building ditches and getting ready to work their claims as soon as possible.

SOUTH DAKOTA.

THE GOLDEN REWARD.—*Pioneer*: The Golden Reward Company has ordered another set of rolls and another roaster with guaranteed capacity of fifty tons per day. The roaster will have a continuous discharge like the White Howell, but is a different model. The new rolls will increase the crushing capacity so that the cyanide plant can be kept in operation and with the new roaster the chlorination plant can be run full capacity.

FOR THE KILDONAN MILL.—The first carload of machinery arrived for the Kildonan mill yesterday. The car was labled, "From Gates Iron Works, Chicago." "For the Kildonan Mill, Deadwood, S. D." It had a No. 1 and No. 3 Gates Crusher, an air compressor, large acid tank and considerable smaller machinery. The balance of the machinery will arrive as fast as it can be unloaded and taken care of.

COLORADO.

BOUGHT SEVENTEEN MINES.—The Portland Mining Company of Colorado Springs has just purchased seventeen mines affecting and conflicting with their claims, as follows: The Black Diamond, D's Own, Tidal Wave, Lowell, Milton, Terrible, Fairplay, Success, Roserie, Casco, Lest Anna, Cyclone, fractions of Blue Stocking, Little Harry, Four Queens, and the Bobtails. The price paid was $1,025,000. The purchase forestalls costly litigation. W. S. Stratton, James F. Burns, James Doyle, John Harmon, J. R. McKinney, F. G. Peck and Walter F. Croshy own the stock principally, which is capitalized at $3,000,000. The deal is by far the largest in the history of the camp.

NEW MEXICO.

THE DE LAMAR PROPERTY.—The De Lamar Mining Company, which purchased all the mines represented in the De Lamar claims near Silver City, in 1890, and formed an organization with a capital of $2,000,000, has the property now paying 20 per cent a year on this investment. The ore runs 60 per ceat gold and 40 per cent silver. The company is doing a vast amount of development work, and much of their great possessions have heen unprospected up to the present time.

ARIZONA.

TO LOCATE PLACER CLAIMS.—*Herald*: A party of mining men have left Phœnix to locate placer claims in the hed of the Agua Fria river below the storage reservoir of the Agua Fria Water and Land Company. The gravel of that river ahounds in placer gold; and as soon as the great reservoir frees the gravel from the water so that it can he worked, exceedingly good wages will he made by the miners who have located claims.

MADE A PROMISE.—Messrs. Murphy and Ryan have promised the miners in Lone Star district to provide them with a smelter and reduction works at Safford if they will agree to furnish thirty tons of ore per day, hearing not less than ten per ce it copper.

BONDED FOR HALF A MILLION.—The Crowned King mine, Bradshaw district, forty miles from Prescott, is reported bonded for $500,000 by the owners, Messrs. Place, Sheckles and Harrington, they receiving a cash surety of $10,000 from the purchasers of the bonds, the H. B. Chamberlain Company of Denver. It is stated to be their intentiou to put on improved machinery and work a large force of men.

GENERAL NOTES.—Fifty thousand pounds of machinery are now on the ground at the Bull Dog mine at Goldfields, besides a large amount of lumber. Work on the twenty-stamp mill has commenced.

Alex McLean, of Morenci, will be superintendent for the recent purchasers of the Old Dominion property at Globe.

O. B. Amsden, superintendent of the Gold Bug Mining Company, was in Kingman recently, preparing to ship a large quantity of mill machinery to the Colorado river, west of the Gold Bug. It is expected that the mill will be completed within sixty days.

Mr. McLeish, of Wickenberg, is about to erect a cyanide plant at Smith's mills, on the Hassayampa, to treat the Vulture tailings. He has about 20,000 tons of tailings stored for that purpose.

MEXICO.

POPOCATEPETL SULPHUR.—*Two Republics*: Sixty-eight men in all are now employed in the work of extracting crude sulphur from the crater of Popocatepetl. This includes those engaged in bringing down the sulphur to Amecamera, those furnishing the miners with provisions and supplies, and those in charge of the Tlamacas ranch, or half-way house. The miners are all Indians and all pertain to one family or tribe, the only persons that have the endurance necessary to the task. Each of them receives $15 bonus for his family before he enters the crater and is paid $3 per diem for his work, and binds himself to remain twenty-five days. The product per man is about 125 pounds of sulphur daily, and the article is 97 per cent pure.

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Mining and Metallurgical Work in All Branches.
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Tests and Estimates for the improvement of Pumping, Power and Hydraulic Plants.
Will supervise the Construction, Shipment or Erection of Machinery. Will make Drawings, Estimates or Specifications.
Prices obtained for machinery of every description. Twenty year's experience.
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STATE ASSAY OFFICE,
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Mining Operator,
ROOM 58, CROCKER BUILDING,
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MINING LAW, MINE EXAMINATIONS, METALLURGY, ASSAYING AND ANALYSIS.
"Consulting Associate Mining Attorney at Law."
Will examine and report upon "Title and Exact Value" of Gold, Silver, Lead, Copper, Coal, Iron, Clay or other Mineral Properties IN ANY PART OF THE WORLD. Any information mining men may desire to know, relative to the MINERAL or COAL resources of the entire Pacific Northwest, will be honestly given.
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Nevada Metallurgical Works,
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Established 1869.
ORES WORKED BY ANY PROCESS.
Ores Sampled.
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Assays of Ores, Minerals, Waters, Etc.
WORKING TESTS (PRACTICAL) MADE.
PLANS AND SPECIFICATIONS furnished for the most suitable process for working ores.
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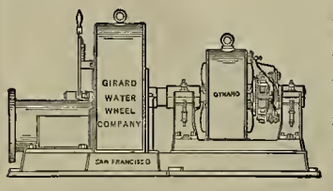
ALBERT MALTMAN, Practical Metallurgist and Engineer.
SAMUEL C. THOMPSON, A. B. Yale University. E. M. Columbia University.
Maltman & Thompson,
MINING ENGINEERS AND METALLURGISTS,
Owners of Nevada County Reduction Works,
Address: Grass Valley, Nevada County, California.
Inspect and report upon Mineral Properties, Treat Refractory Gold Ores and Concentrates by Chlorination. Furnish Plans for and Superintend Erection of Chlorination Plants, General Analyses of Ores.
References:
Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.
Edward M. Preston, President Citizens' Bank of Nevada City, California.

John Taylor & Co.
63 First St., San Francisco, Cal.
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Sole Agents for the Pacific Coast for the W. S. TYLER WIRE WORKS CO., manufacturers of
Steel and Brass Wire Battery Screens.
We have on hand the following second-hand assay balances; they have been carefully readjusted and are practically as good as new:
One No. 12 Oertlings Balance for... $100 00
One No. 2 Froemner Balance for..... 50 00
Two No. 16 Becker Pnlp Balance, each 15 00
Send for Catalogue and Assay Table.

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Aggregating over 400,000 horse power. Adaptation made to all conditions and every variety of service.
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PELTON WHEELS are the recognized standard for electrical work and are running a majority of the stations of this character in all parts of the world.
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THE PELTON WATER WHEEL CO.,
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American Girard Water Wheel.


Adaptable to all heads between 30 feet and 2000 feet, particularly where economy in the use of water and fine regulation are desired, as, for instance, the operation of electric dynamos.
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CASCADE WATER WHEEL
Adapted to all heads, from 30 FEET TO 2000 FEET. Our experience of 33 YEARS in the water wheel business enables us to suit every requirement of water power plants. Send for illustrated pamphlet. This new wheel has given an unequaled Economy in Water.
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CORNER FIRST AND MISSION STREETS, - - - - - SAN FRANCISCO, CAL.

—MANUFACTURERS OF—

MINING AND MILLING MACHINERY,

Automatic Cut-Off Engines, High-Speed Engines, Hoisting Engines, Quartz Mills,
Manty Chili Mills, Rolls and Concentrating Machinery, Dodd Sigmoidal Water Wheel,
PUMPS--Cornish and Other, Copper and Lead Furnaces, All Classes of Marine Work.

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For Saving Gold

IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated bought, or gold separated. THOUSANDS OF ORDERS FILLED.

San Francisco Novelty and Plating Works

Incorporated.

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Justinian Caire, Agent

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—DEALER IN—

Assayers' and Mining Material.

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Machinery.

23 Park Place, - - - - New York, U. S. A.

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Ishpeming	Michigan
1316 Eighteenth Street	Denver
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Apartado 830	City of Mexico

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These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

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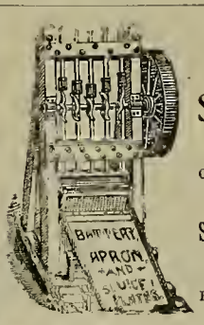
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GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

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Telephone, Main 5031.

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Every description of work plated. Send for Circular.

Mining Pipe!



STEEL OR IRON.—We make pipe of either, but recommend STEEL, it being superior to iron in many particulars and inferior in none.

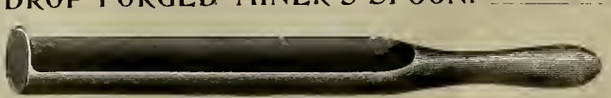
COATING.—We use great care in COATING our pipe with a HOT solution of Double Refined Asphaltum and Maltha.

COMPETITORS.—Our competitors say we have the best appointed Pipe Shop on the Coast.

SCHAW, INGRAM, BATCHER & CO., Hardware Merchants,

SACRAMENTO, CAL.

DROP FORGED MINER'S SPOON. Sample by Mail, 10c.



THIS CUT ONE-HALF SIZE.

Manufactured by COLUMBUS BOLT WORKS, Columbus, Ohio.

Market Reports.

The Markets.

SAN FRANCISCO, Aug. 8, 1895.

The metal market still holds up, with strong prices. Copper, especially, shows appreciation. Advices from the Michigan copper mines say that mining men there generally believe that twelve cents a pound will be the price within three months. Enthusiasts are predicting still higher prices, hut twelve cents a pound is plenty of money for a pound of copper. There are enough mines in the country to supply all the metal that is required for that price, and, while paying good wages to their men, return ample profits to stockholders. A higher price will mean a feverish market, greater opportunities for manipulation and the opening of a lot of semi-worthless properties which will get to producing about the time that the hottom drops out, and will score another hig loss to their stockholders, while at the hetter mines wages will suffer, profits will drop and general demoralization will follow.

There are several mines producing copper just as cheaply as the Calumet and Hecla, though not in such amounts, and with their product selling at 12 cents there is not an active mine on Lake Superior which cannot pay good profits to its shareholders. That the Quincy earned $592,000 last year with copper helow 10 cents shows what some of the larger mines can earn on 11 and 12 cent copper. It is said that there is a pool hehind the Boston & Montana pledged to sell no stock short of $100 a share.

New York Metal Market.

NEW YORK, Aug. 8.—PIG IRON—Southern, 11@14c; Northern, 12@14c.
COPPER — Brokers', 11.60 @ 11.65c; exchange, 11.95@12c.
LEAD—Brokers', $3.37½; exchange, $3.55.
TIN—Straits, 14.60@14.65c.
SPELTER—Domestic, $3.95.

New York Silver Prices.

NEW YORK, Aug. 8.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.
Friday	30¼	66½	11 10	.....
Saturday	30¼	66⅜	11 20	3 25
Monday	30⅛	66¼	.....	3 30
Tuesday	30¼	66⅛	.....	.....
Wednesday	30⅛	66¼	11 25	3 25
Thursday	30⅜	66⅜	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.89½
London Merchants	$4.87½
London Sight Bankers	$4.90¾
Refined Silver, per ounce	65¾c
Mexican Dollars, nominal	54c

San Francisco Metal Market.

COPPER.			
Bolt	¼ & 5-16, 17c; ⅜ and larger, 17c		
Lake Superior Sheathing	19	@	—
Ingot, jobbing	—	@	15
Ingot, wholesale	14	@	13
Sheet copper	—	@	18
ZINC.			
Sheet	9	@	
LEAD.			
Pig	—	@	4 00
Bar	—	@	4 10
Sheet	—	@	5 35
Pipe	—	@	4 85
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do, "		"	1 45
IRON.			
American Soft	15 00	@	17 00
Pig, per ton	16 00	@	19 00
STEEL.			
English, lb	15	@	17
ANTIMONY.			
Per lb	—	@	10
COKE.			
Gas Companies'	75c	₱	bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —
PIG TIN.			
Per lb	15	@	16 00
QUICKSILVER.			
Home trade, per flask	41 00	@	— —
TIN PLATE.			
Per bx	5 25	@	6 00
BORAX.			
Refined, in car lots	—	@	5⅛
Refined, in sacks and barrels	—	@	5⅜
Powdered, in car lots	—	@	5⅜
Concentrated, "	—	@	4⅞
ZINC.			
Sheet	8½	@	

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00		
Greta	7 00		
Nanaimo	6 50		
Gilman	6 00		
Seattle	6 50		
Coos Bay	5 00		
Cannel	8 00		
Egg, bard	12 50		
Wallsend	7 00		
Scotch Splint	7 50		
Brymbo	7 50		
TO ARRIVE—CARGO LOTS.			
Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —
NAILS.			
Wire			$2 30
Cut			2 00
LUMBER. SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Belcher S M Co., Nev	51	25c	July 16, Aug 20, Sept 10	C L Perkins, Mills Building
Best & Belcher M Co, Nev	58	25c	June 12, July 18, Aug 10	M Jaffe, 309 Montgomery
Con Imperial, Nev	36	1c	Aug 5, Sept 12, Oct 3	C L McCoy, Mills Building
Evening Star M Co, Cal	19	1c	Aug 5, Sept 10, Sept 22	J J Scoville, 320 Sansome
Cold Bar Cons M Co., Cal	1	3c	May 24, Jun 29, Aug 21	E C Godfrey, Crocker Building
Gould & Curry, Nev	76	15c	July 2, Aug 6, Aug 28	A K Durbrow, 309 Montgomery
Kentuck Con, Nev	11	10c	Aug 6, Sept 10, Oct 1	Aug Waterman, 309 Montgomery
Mono M Co, Cal	35	10c	July 16, Aug 15, Sept 10	M E Willis, 309 Montgomery
Occidental Con M Co. Nev	19	10c	June 25, July 30, Aug 21	A K Durbrow, 309 Montgomery
Ophir S M Co, Nev	66	25c	July 11, Aug 13, Sept 2	E B Holmes, 309 Montgomery
Potosi M Co, Nev	44	25c	July 14, Aug 14, Sept 4	C E Elliott, 309 Montgomery
Sierra Nevada S M Co, Nev	109	25c	July 30, Aug 30, Sept 23	E L Parker, 309 Montgomery
Union Con	51	20c	June 18, July 19, Aug 15	A P Swain, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Alta S M Co, Nev	J E Jacobus, 309 Montgomery	Aug 15
Navajo M Co, Cal	J W Pew, 310 Pine	Aug 13

Mining Share Market.

SAN FRANCISCO, August 8, 1895.

The Hale & Norcross decision was the feature of the week. The singular part of it is that though it enhanced the value of the stock, the first result was a drop in its price. One would naturally suppose the stock would have soared to $2.50 or even $3 on the strength of Judge Beatty's decision, hut it fell off instead, going on Monday as low as $1.30, although the decision was virtually affording a $1.50 dividend. The salient points in the long-expected decision are published on pages 86, 87 and 90 of this issue. The decision, it is thought, will tend to improve the general tone of the mining share market, and will tend to dispel delusions that have found lodgment in many minds. While in some respects the rulings are a little contradictory, yet the manifest intent is to he fair; and now if there he not too much of a difference between the judgment and the satisfaction of the amount adjudged, it will he of material henefit to the long-patient stockholders.

But the hest results of last Saturday's decision is that it serves notice "to whom it may concern" that such practices as that complained of in the Hale & Norcross suit cannot continue or he repeated with impunity. It will do considerable to restore confidence and put some life into the market, and the hest friends of the mining share market rejoice at the result.

The Calumet and Hecla (Michigan) Copper Mining Co. will pay a $500,000 dividend on the 19th, the higgest regular company dividend of any listed mine in the United States.

The Church Mining Co. paid a dividend of five cents per share on the 8th.

The $8 per share assessment on the Norman mine, Pinal county, Arizona, was delinquent on the 6th. The Potosi, Nevada, $28,000 assessment will he delinquent on the 14th; the Belcher, Nev., assessment of $26,000 on the 20th; the Ophir, of $25,200, on the 13th; the Mono, Cal., of $5000, on the 19th.

The Hite Gold Mining Co., of Mariposa Co., has levied an assessment of eight cents per share.

The agreement hetween the Ophir, Mexican, Andes and West Consolidated Virginia and California mining companies, to explore the Comstock west country from the most westerly workings on the 1100 level of the Con. Virginia shaft, previously described in detail, is finally in determinate shape. For sixty days the Ophir and Mexican companies shall expend $1000 per month, the Andes $500 and the West Consolidated Virginia and California as much as all the others expend, upon the work of drilling westward from the end of the west crosscut, which the West Consolidated have heen running from the north lateral drift on the 1100 level of the Con. Virginia. When work stopped the face of the drift was 1535 feet west of a north and south line drawn through the Con. Virginia shaft. A pipe for compressed air will he laid from the Ophir shaft to the Con. Virginia shaft and thence downward and to the end of the west drift. The drilling operations are to he conducted by Superintendent H. W. Tangermann of the West Con. Virginia and California; the superintendents of the Ophir, Mexican and Andes mines are at all times to have access to the drift and allowed to take samples of the drill pulp. Should any ore discoveries be made each company will have the privilege of using the west drift and the Con. Virginia shaft as outlets in developing its own ground.

The Rawson Ditch Company of Inyo county has levied an assessment of 3 cents per share, delinquent August 24th.

The following is the usual monthly statement of moneys on hand:

BONIE MINES.		Crown Point	$12,158 79
Bodie	$12,440 86	E. Sierra Nev.	83 37
Bulwer	3,835 30	Exchequer	1,463 42
Mono	1,663 59	Gould & Curry	1,163 37
Standard	30,129 75	Hale & Nore'ss	17,540 53
Syndicate	886 67	Julia	1,079 14
WASHOE MINES.		Justice	5,342 51
Alpha	$ 4,706 05	Lady Wash'n	1,089 68
Alta	4,580 59	Mexican	18,362 32
Andes	11,826 63	Occidental	6,917 33
Belcher	1,038 65	Overman	8,308 94
Best & Belcher	12,953 25	Potosi	1,272 50
Bullion	8,641 50	Savage	1,241 41
Caledonia	2,562 98	Scorpion	176 39
Challenge	2,189 76	Seg Belcher	1,112 26
Chollar	23,702 11	Silver Hill	1,101 74
Con. Cal & Va	27,473 18	Sierra Nevada	3,605 44
Confidence	4,493 63	Union Con	18,041 40
Con. Imperial	168 08	Utah	227 03
Con. New York	1,414 40		

The Con. Cal. & Va. has $31,876.76 in unsold hullion on hand.

The payroll of the Comstock mines in July was as follows: Hale & Norcross $2652, Andes $1050, Con. California & Virginia $10,045.50, Mexican $1833.50, Ophir $3745.50, Best & Belcher $1790, Gould & Curry $1346.50, Alta $1320, Utah $125, Occidental $1302, Brunswick Exploration Company $2099.10, Savage $2500, Crown Point $7710.66, Yellow Jacket $1975, Confidence $108, Challenge $108, Belcher $3328, Seg. Belcher $836, Chollar $3678, Potosi $1880, Union Shaft $2555, Bullion $1253, Sierra Nevada $795, Alpha and Exchequer $733, Nevada Mill (estimated) $2500, Electric Light (estimated) $500, Water Company (estimated) $3000, Quartz Mills (estimated) $7000. Total $77,718.76 The payroll is over $6000 higher than for June.

The following illustrates the changes of the week:

Mines.	Aug. 1	Aug. 8
Alpha	$ 08	.....
Alta Consolidated	10	.....
Andes	26	$ 30
Belcher	26	27
Best & Belcher	89	94
Bodie	14	.....
Bullion	16	20
Challenge	27	.....
Chollar	.....	68
Confidence	80	.....
Consolidated California and Virginia	2 60	2 90
Consolidated New York	.....	.....
Crown Point	38	.....
Exchequer	.....	.....
Gould & Curry	35	54
Hale & Norcross	1 55	2 00
Justice	.....	.....
Mexican	64	67
Ophir	1 25	1 30
Overman	.....	16
Potosi	32	34
Savage	37	41
Sierra Nevada	42	44
Union	.....	50
Utah	.....	.....
Yellow Jacket	31	36

San Francisco Stock Board Sales.

SAN FRANCISCO, August 8, 1895.

9:30 A. M. SESSION.

50 Andes	27	200 Mexican	66
100 Belcher	26	700 Occidental	31
150 Con Cal & Va	2 70	100 Ophir	1 30
400 H & N	1 65	50 Sierra Nevada	40

SECOND SESSION—2:30 P. M.

200 Mexican	67	100	66
300 Gould & Curry	54	450 Potosi	33
350 Best & Belcher	94	150	34
400 Con Cal & Va	2 85	1750 Hale & Norcross	2 00
550	2 90	100 Yellow Jacket	36
20	2 80	350 Belcher	27
350 Savage	41	100 Sierra Nevada	44
100 Union	50	200 Bullion	17
600 Occidental	32	300	19
400 Andes	30	400	20
1000 Chollar	65	50 Overman	16
700	67	100 Seg Belcher	09
100	68		

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San Francisco Offices, Suite 86 and 87, Chronicle Building.

Assessment Notices.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 25th day of June, 1895, an assessment (No. 19) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of July, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 21st day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.
ALFRED K. DURBROW, Secretary.
Office, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

KENTUCK CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the sixth day of August, 1895, an assessment (No. 11) of Ten (10c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room No. 23, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the tenth day of September, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the first day of October, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.
AUG WATERMAN, Secretary.
Office—Room No. 23, Nevada block, No. 309 Montgomery street, San Francisco, California.

DELINQUENT SALE NOTICE.

GOLD BAR CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 24th day of May, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
John E. Todd	5	2,500	$ 50 00
John E. Todd	6	2,500	50 00
John E. Todd	9	2,500	50 00
John E. Todd	55	2,500	50 00
Jas. P. McCarthy	13	625	12 50
Jas. P. McCarthy	63	2,500	50 00
Jas. P. McCarthy	64	2,500	50 00
Jas. P. McCarthy	65	2,500	50 00
Jas. P. McCarthy	66	2,500	50 00
W. A. H. Connors	14	625	12 50
W. A. H. Connors	52	1,800	36 00
John H. Page, Trustee	22	500	10 00
John H. Page, Trustee	23	500	10 00
John H. Page, Trustee	84	9,000	180 00
C. A. Moore, Trustee	28	5	10 00
C. A. Moore, Trustee	29	4,995	99 90
C. A. Moore, Trustee	32	16,666	333 32
L. N. Pattison	53	1,000	20 00
J. S. Herron	41	300	6 00
E. C. Godfrey, Trustee	74	6,000	120 00
E. C. Godfrey, Trustee	57	1,000	20 00
E. C. Godfrey, Trustee	58	500	10 00
E. C. Godfrey, Trustee	59	500	10 00
E. C. Godfrey, Trustee	60	200	4 00
E. C. Godfrey, Trustee	85	2,500	50 00
E. C. Godfrey, Trustee	86	4,000	80 00
Louise V. Rugg	36	10,000	200 00
A. U. Rugg	33	16,667	333 34

And in accordance with law, and an order from the Board of Directors, made on the 24th day of May, 1895, so many shares of each parcel of such Stock as may be necessary will be sold at public auction at the office of the Company, Room 38, Crocker Building, corner Montgomery and Market streets, San Francisco, California, on Monday, the 22nd day of July, 1895, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

E. C. GODFREY, Secretary.
Office—38 Crocker Building, San Francisco, California.

POSTPONEMENT.

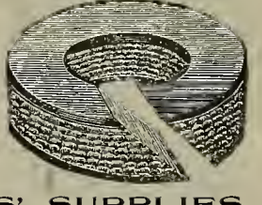
By a resolution of the Board of Directors of the Gold Bar Consolidated Mining Company the day of sale of the above delinquent stock has been postponed to WEDNESDAY, August the 21st, 1895, at the same place and at the hour of 2 P. M.

E. C. GODFREY, Secretary.
Office—Room 38 Crocker Building, San Francisco, California.



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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING JULY 30, 1895.

543,668—HAIR CLIPPER—F Baugerter, S. F.
543,722—GAME—J Q Brown, Jr., S F
543,723—BICYCLE BRAKE—J Christensen, S F
543,724—BICYCLE BRAKE—J Christensen, S F
543,728—HANDLING PROJECTILES. Theo Forssell, Vallejo, Cal.
543,516—PROCESS—E. J. Fraser S. F
543,691—LANTERN—Kennedy & Mathews, Oakland, Cal.
543,701—VEHICLE TIRE—A J. Rudolph, S. F
543,708—TELEPHONE EXCHANGE—W. Y. Shibata, S F.
543,516—BED PAN—J. W. Vaughn, Los Angeles, Cal.

NOTE. Copies of U. S and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SELF MEASURING LIQUID TANK.—Christopher M. Bridges of Seattle, Wash., assignor of one-half to John S. Fanning of S. F. No. 543,169. Dated July 23, 1895. This invention relates to the class of self-measuring tanks adapted for the disbursement of various liquids, but especially for the measuring of oil. The device consists of a main supply vessel, a main measuring vessel of known capacity in the lower portion of the shell of the supply vessel, other vessels of known and different capacities contained within the main measuring vessel, a pipe leading from the main supply and connected with a pipe leading from the main measuring vessel; other pipes leading from the main supply vessel and connected with pipes leading from the interior measuring vessel; cocks at the junction of each pair of pipes and a single discharge pipe into which the contents of the one or all of the measuring vessels may be discharged singly or collectively.

CAN FILLER FOR ICE MACHINES.—Richard F. Schroeder, Sacramento, Cal. No. 543,159. Dated July 23, 1895. This invention relates to a device for filling cans, which is especially adapted for use in conjunction with the cans in which water is frozen in ice machines. It consists of a can having a vertical central supply pipe; a spider in the bottom of the can into which a supply pipe is fixed; a valve chamber, into which the pipe discharges; a downwardly closing valve, with a stem resting upon the bottom of the can, whereby the valve is kept open while the spider is at the bottom; a second spider fixed to the supply pipe near the top of the can; a float fitting the interior of the can and movable loosely therein about the central pipe between the two spiders, said float being raised as the can is filled with water, and acting to raise the upper spider and connected pipe and with it the lower spider, when the can is filled, whereby the supply valve is closed and the surface of the water is kept out of contact with the air.

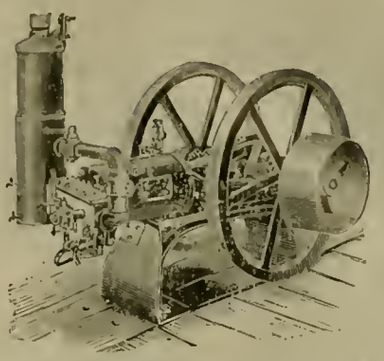
EXPLOSIVE ENGINE.—Michael L. Mery, Chico, Cal. No. 543,157. Dated July 23, 1895. This invention relates to explosive engines of the double-acting class, and its object is to provide an engine of this kind, simple in its construction of parts, efficient and accurate in its explosions and capable of easy and perfect adjustment. The details of improvement in the engine are numerous and relate principally to the sparking apparatus, the means for regulating and adjusting it, the means for operating it, the means for insulating the stems of the electrodes, the valves and the means for operating them, and the means for drawing in fresh air into the engine when the exhaust valves are opened.

TELEPHONE EXCHANGE.—W. Y. Shibata, San Francisco, Cal. No. 543,160. Dated July 23, 1895. This invention relates to an automatic telephone exchange system, in which each subscriber is enabled to connect himself at pleasure with any other subscriber, and to disconnect himself therefrom. It consists of parallel non-conducting bars having metallic conducting plates extending across them, and connected in alternate groups with the line wires; tracks having their upper surfaces toothed, extending across above the bars and plates; cars having gear wheels adapted to engage the teeth of said tracks; electro magnets; means for transmitting a current through the electro magnets; swinging permanent magnets movable between the cores of the electro magnets and caused to oscillate about their fulcrum points by the energizing and de-energizing of the electro magnets; pawls hinged to the lower end of the swinging permanent magnet, adapted to engage the teeth of the track and non-conducting cords connecting with the pawls and with arms upon the swinging magnet, said cords passing through guides, whereby the swinging of the magnet to one side will disengage one of the pawls and engage the other, so that the car will be moved constantly in one direction, and the reversal of the current will reverse the position of the pawls so as to move the car in the opposite direction. Non-conducting shields are arranged with relation to the tracks, so that the contact will not be formed except for the particular car that is to be operated, and exchange boxes are located at the station of each subscriber, with indicators movable over dials upon the boxes at the subscribers' stations, and switches and contacts whereby the cars at the central station are moved upon their corresponding tracks until communication with any desired subscriber is obtained.

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Coal Gas, ten hours' run, 1000 feet	$2 00
Gasoline (74 deg.), ten hours' run, 8¾ gallons @ 11c	1 25
Coal Oil, ten hours' run, 7½ gallons @ 10c	75
Crude Petroleum, asphaltum base, 10 gallons @ 8c	80
Crude Petroleum (36 deg.), paraffin base, 13 gallons @ 5c	65

On the crude petroleum with asphaltum base we had an over-product of 7 gallons of asphaltum; the market price is 3 cents per gallon—21 cents. This deducted from the first cost of the crude petroleum for ten hours' run leaves a net balance of 27 cents. And from the crude oil with a paraffine base we had an over-product of 3 gallons of good lubricating oil, which we consider equal to any we have ever used, but will estimate its value conservatively at 20 cents per gallon, making 60 cents; this deducted from the first cost of the crude oil leaves a balance of 5 cents, total cost of running ten hours.

It will be readily seen that the operation of these Engines with crude petroleum reduces the cost of operation to a minimum. Crude petroleum with paraffine base at 1-10c per horse power per hour; on crude petroleum, asphaltum base, ¼c per horse power per hour; on domestic coal oil, 1½c per horse power per hour; and on gasoline, 2½c per horse power per hour.

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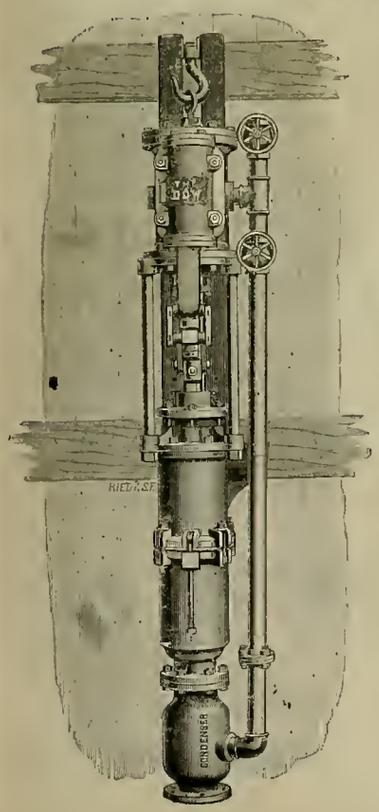
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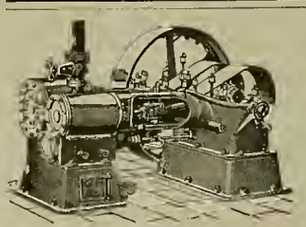
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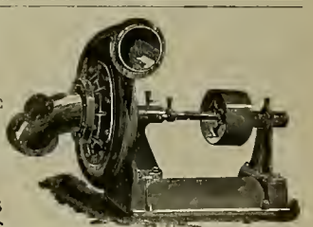


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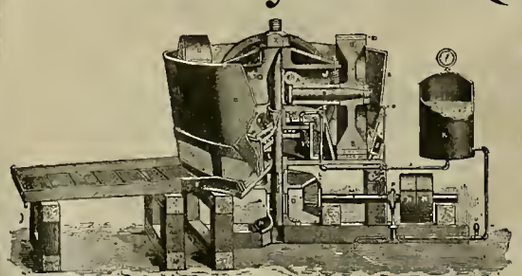


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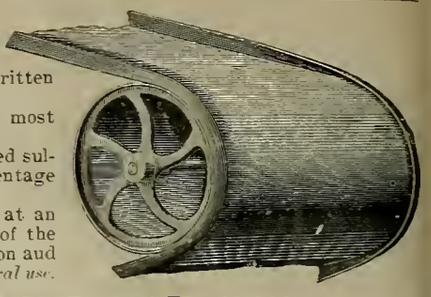
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Our second patent is for an improvement in the flanges which practical mill men will appreciate. They stand at an acute angle inwardly, therefore they thoroughly confine the pulp on the belt; and in passing over the end pulleys of the machine, lie partly down, consequently do not crack or break, as do the old-style flanges; thereby much vexation and loss is avoided. *We keep in San Francisco and New York belts of all lengths and widths suitable for all concentrators in general use.*

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VOLUME LXXI. Number 7. SAN FRANCISCO, SATURDAY, AUGUST 17, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Some Desert Mining Country.

In Inyo county, on the southeastern border of this State, are the highest and lowest lands in the United States, and within fifty miles of each other—Mt. Whitney, 15,000 feet above sea level, and Death Valley, 480 feet below sea level. Whitney is the culmination of the southern Sierras; Death Valley, between the Panamint and Amaragosa ranges, the arid bed of an ancient lake.

The country is more like Nevada than California in its climate, physical aspect and mineral deposits. To the prospector in northern or central California, or the States of Oregon, Washington, Idaho and Montana, where grass, timber and water are almost always accessible, the desert region of Mono and Inyo counties (of which the two points named are the most prominent) have nothing but repellant features. The absence of vegetation, the intense heat, the irritating alkali and the somber silence make a combination the reverse of attractive to the prospector or miner.

Yet that whole region has been prospected, many a poor fellow leaving his bones to bleach there and considerable mineral wealth extracted. The country is rich in gold, silver, lead, antimony, copper, iron, soda, borax and building stone. A view is given of Cerro Gordo, not an ideal place of residence, yet the writer spent some of the happiest years of his life in just such a place. Around Cerro Gordo are rich deposits of silver and lead; of course, at present prices, nothing is done there, for, unlike Montana and parts of Colorado where even now silver and lead can be produced as by-products, transportation is a tedious and costly affair, it being necessary to carry nearly everything used on mules and burros. An illustration appears herewith of a pack train in its quieter moments. The patient beasts are better than horses; and though at times irascible and provocative of profanity, they are the best craft by and on which to navigate the desert mining country.

Volcanic tufa and hornblende andesite prevail in the northern and western part of Inyo county; in the eastern and southern part is coarse granite and limestone. The Panamint range is a prominent feature for sixty miles in this desolate country; it is mostly made up of limestone, quartzite, slate and mica schist. Accompanying is a view of Death Valley from one of the Panamint peaks. Though the Panamint range is characterized chiefly by silver deposits, considerable gold has been found in the southern part. Gold has also been found in paying quantities at the western base of the Inyo range and southeast of Independence. Along the western slope of the White mountains, northeast of Bishop Creek, is a gold belt, and between Benton and Owens river, as well as at Mammoth, in the southwestern part of Mono county, gold ore, not free milling and of low grade, has been mined in considerable quantities. "Remote, unfriended, melancholy, slow," the part of California's mining area here briefly referred to is seldom noticed and little understood. Its inaccessibility has retarded its development. Rich in precious metals, it will yet assume prominence; increased facility of transportation, improved processes, the utilization of electrical force, will aid in bringing this neglected section to the front. It is a country where, so far, every dollar in gold and silver produced has cost three, if all things be considered; but all countries have to have their pioneers, and in this desert land where none but the bravest ventured and none but the strongest survived have been scenes of trial and endurance equal in point of interest and merit to those of any mining region on the earth.



PACK TRAIN IN PANAMINT VALLEY.

In the present gold renaissance Nevada is the slowest of States. The commonwealth that so long astonished itself and the rest of the world with silver mines that paid a clear profit of hundreds of millions of dollars, has appeared to cling to the memories of the past rather than realize the possibilities of the future. There are signs of an awakening. Nevada prospectors are beginning to feel that the old Silver State is not destitute of gold; that the mineral wealth of that arid region is not confined to silver alone, and that, if sought for, paying gold properties can be found. There are plenty of places in Nevada that are richer in gold than in silver. The old days of the chlorider will never return. A line drawn from St. George, Utah, to Lakeview, Oregon, would bisect the State, and the territory lying in Nevada to the westward of that line will some day be found to be as rich in gold as, barring the Comstock, it was ever found to be in silver.



DEATH VALLEY FROM THE PANAMINT RANGE.



CERRO GORDO, INYO COUNTY.

MINING AND SCIENTIFIC PRESS.

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J. F. HALLORAN.....General Manager

San Francisco, August 17, 1895.

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MISCELLANEOUS.—A Letter From Mr. Ford; Concentrates, 103. Mineral-Bearing Veins; The Wet and Dry Seasons in California, 104. Mining on the Colorado; Cyanide or Other Chemical Proportions for Laboratory and Mill Workings, 105. Coast Industrial Notes, 107. Notices of Recent Patents, 115.

LAST WEDNESDAY A. H. Ricketts, chairman of the Committee on the Protection to Mineral Lands of the State Miners' Association, received a formal notification from E. F. Best, acting commissioner of the General Land Office, that the appeal transmitted July 29th from the dismissal of previous protests had been forwarded to Sec'y of the Interior Smith. The protests were against the granting of a patent to the S. P. Co. for 100,091 acres land in the Visalia, San Francisco, Marysville and Los Angeles districts and had been dismissed by Mr. Lamoureux. This was appealed from. These appeals now go to the Secretary of the Interior, so that this matter has at last got out of the office where subordinate subserviency to corporate suggestion is so manifest and goes to a cabinet officer to be adjudicated. It is a decided victory for the miners and a substantial answer to those who ask "What has been done?" A great deal has been done; a great deal remains to do. It is a long step when this whole matter is at last before the Secretary of the Interior and the President of the United States, who personally assured the miners' representative that he would give the matter his individual attention.

COLUSA COUNTY has discontinued its monthly allowance to the Anti-Debris Association. The Board of Supervisors say it is no longer necessary. There is certainly no need for Colusa county or any other county to be burdened with the expense of such an organization, which is neither useful nor ornamental and whose existence is rendered unnecessary by the prompt, impartial and incessant activity and jurisdiction of the U. S. Debris Commission. It is simply a question between the tax-payers and tax-eaters of the valley counties. Whenever the former realize that whatever appearance of necessity for the perpetuation of such an association may have once existed there is no present nor prospective need of it, and that they are simply furnishing employment to two or three local lawyers and informers whose business it is to stir up strife and induce hostility, they will decline to make it of continuous profit. The U. S. Debris Commission has its trusty agents traveling through the whole mining region. Wherever in ignorance or defiance of federal law there is the slightest appearance of its possible infringement the hydraulic miner is summarily dealt with far more promptly and effectively than any anti-debris association could. Of course, if the good people of Colusa, Sacramento, Sutter and Yuba see fit to continue to pay $10,000 a year through their hoards of supervisors to keep a few tax-eaters in a job, that is their business and none of ours. It is likely, however, that in these times of scarce dollars among those who work so hard for the few they get, the tax-payers will refuse to longer hear such unnecessary burden.

The Miners' Association.

Several sensational statements in last Sunday's San Francisco newspapers regarding alleged "rows," "angry debates," "battles," etc., at the meeting of the executive committee of the State Miners' Association on the 9th inst., being given credence and further publicity throughout the State, it is in order to give an unbiased statement of exactly what was done. There were no "rows," nor "battles" nor "angry debates." The writer was present throughout, and though it was an executive session, so much publicity has been given the matter that the usual requirements of not publishing the proceedings should in this case be ignored, in the interests of the Association, which are the only interests that the MINING AND SCIENTIFIC PRESS recognizes.

The first business before the meeting was regarding the claim of Mr. Moran for maps furnished the Association, there being a disputed bill which was settled by the claimant accepting the proffer of the committee and giving a receipt in full. Upon request of Mr. Moutague, Secretary Ralston gave a detailed report of receipts and expenditures since the date of the last convention, in Novemher, '94, it appearing that he had received no salary for the last nine months. Mr. Ralston said that he would donate that amouut—$450—to the Association. (It may be said here that that is the only salaried office connected with the Association, aud this fact, together with Mr. Ralston's characteristic generosity in the matter, should certainly put a stop to unkind comments regarding "expense" and "extravagance" in sundry interior journals.)

The question of holding the next couvention then came up; Mr. Cross spoke earnestly in favor thereof, offering a resolutiou regardiug it and warmly opposing any suggestion that might arise regarding possible or probable relaxation of effort or disbanding of the Association. Discussion of the resolution branched off to a review of what had been done, and, incidentally, to the work of the mineral land committee. Mr. Ford spoke of the work of that committee with praise, intimating that it was his helief that other important duties of the Association should not be obscured or ignored, and the discussion being more informal than parliamentary, that is, not bound by strict rules of dehate, the former suggestion of a "conference with the railroad company," that is, an acceptance of a proffer of arbitration uuderstood to have come from representatives of the S. P. and C. P. companies, outside of the Association, was hrought up. Mr. Thomas moved that a committee be appointed to so coufer. President Neff appointed Messrs. Thomas, Ricketts and Wright, the two latter being prominent members of the mineral land committee. Before the appointment of the committee and just after the passage of the resolutiou authorizing the chair to so appoint, Mr. Wright made some remarks suggestive of a belief that the hest interests of the Association required great care in the naming of that committee, that any one who assumed to be susceptible to railroad influence should be kept off that committee; he referred to the course pursued by Mr. Ricketts, chairman of the mineral land committee, enlogizing its manner and result and expressing his belief that no good could come from the proposed conference, as it had been asserted that the commissioners would be "captured" hy the railroad company. He disclaimed any intention to reflect upon any one present or in any way connected with the Association, hut expressed the belief that the motion made by Mr. Thomas was prompted by the railroad company, and that from a conversation reconnted to him hy another member of the mineral land committee he had reason to helieve that Mr. Cross would he satisfactory to the S. P. and C. P. companies as an intermediary. This brought Mr. Cross to his feet, who disclaimed the imputation, reviewed what had been done and his part therein, being followed by Mr. Ford, who also stated that throughout his only aim and desire was to help the Association in the work it had started to do.

When Chairman Neff announced the committee, Messrs. Wright and Ricketts in turn declined to serve, it appearing that the creation of a new committee supplauted without supplementing the lahors of the former one. Mr. Thomas said he would serve, and made a speech stating that in Nevada county the miners thought too much attention was heing paid the matter of mineral lands and too little to other things. Mr. Ricketts, who, except when uttering the single sentence, "I respectfully decline to serve on the committee," had kept silence during the evening, now arose and said: "I respectfully teuder my resignation as chairman of the committee on the protection of mineral lands and as a member of that committee." Upon this Mr. Montague said it seemed that possible injustice or indifference to the mineral land committee had been displayed in taking the matter out of their hands, so far as the proposed confereuce with the railroad people was concerned, and moved a reconsideration. Mr. Thomas rose to a point of order, hut the chair overruled him, good-humoredly calling attention to the fact that if strict parliamentary rules were observed the whole discussion was not in order pending action on Mr. Cross's resolution regardiug the coming convention, which, according to Cushing, had precedence. Mr. Montague's motion prevailed, and a further motion by him that the matter of conference be left with the former mineral land committee as originally constituted, with power to act, also carried. Mr. Ford then resigned from the chairmanship of the legislative committee and from the Association. Subsequently his resignatiou, as also that of Mr. Ricketts, was withdrawn, and Mr. Cross's resolution that the usual convention be held was carried.

In another column Mr. Ford shows that he is heart and soul with the Association. The same may be said of every member present and of every one who is on the exccutive committee or actively connected with the Association. While there are and have been, and doubtless will he, difficulties and discouragements and differences of opinion, what organization composed of earnest men is free from such things? It is unwise and unfair to assume that anything but the best of feeling exists; it is unjust and untrue to cite the Association as questionahle of existence and filled with distrust and dissension; and, contrary to the facts, to quote sensational statements made with no other motive than simply a desire to be interesting. Were the Miners' Association a sleepy symposium that weekly met and dozed comfortably over abstract subjects, a possible three-line paragraph would be accorded its dusty annals. The fact that it is composed of intelligent, active minded men and is called upon to discuss questions vital to the industries of the State brings out in debate the vim and vigor that characterize vigorous minds. But earuestness must not be mistaken for malice nor force of iutent for disposition to oppose or destroy; and published reports of the meetings of the committees, as of other committees in other public duties, do not always convey correct impressions of the action, intent or results. The Miners' Association is unitedly and unselfishly working for the rehahilitation of the mining industry of this State, for the proper adjustment of the ownership and control of the mineral land withiu the limits of the commonwealth, and deserves and invokes the aid—not in silent assent hut in active effort—of every citizen interested in our progress.

THE renewed attention given California gold properties hy the daily press of this city indicates the renewed interest in the mining industry of the State. Columns are now daily published and the result must be of benefit. California has never adopted the "hoom" method of advertising its great mining resources, and strikes and sales are daily made which, if taking place elsewhere, would be widely heralded. To direct attention to our mineral wealth and truthfully portray our great advantages should be the province and the purpose of every newspaper man in the State, and the MINING AND SCIENTIFIC PRESS gladly notes the powerful aid in this regard so recently enlisted.

The Mechanics' Institute.

The 28th Industrial Exposition of the Mechanics' Institute of this city began last Tuesday under very favorable auspices. The opening exercises were held in the Columbia theater in the afternoon. Mr. Andrew S. Hallidie, president of the Institute, delivered the address, in the course of which he said that the purpose of this exhibition has been principally educational. In its preparation the management has endeavored to provide space for the representation of all the local industries, but many may have been unable to obtain space from the late hour of their application and from the lack of available room. As there has been an interruption in the regular industrial expositions of the Mechanics' Institute since the fall of 1891, a reorganization of the administration became necessary and many new features have been ingrafted, which will be improved in the future, the intention being to hold these expositions annually hereafter, and during this interregnum this State and city have gone through a period of remarkable depression and lethargy. This depression and this lethargy are passing away.

San Francisco, during the interval between the census of 1880 and 1890, has fairly well held its industrial rank among the ten or twelve leading cities of this country. It has advanced in rank one point (from ninth to eighth) in population and has lost one point (from eighth to ninth) in the number of shops and factories. On the other hand, it has increased the amount of money invested, and stands ninth in the list in 1890 and tenth in 1880, and there has been no change in its rank in that decade in the number of hands employed, the amount paid out for wages and the value of the goods produced, which have been respectively eleventh, tenth and ninth. The value of the raw material has been higher, as in this particular the city has advanced from the ninth to the eighth in rank.

Mr. Hallidie's address was interesting and instructive throughout and received much deserved applause.

Congressman Maguire delivered an oration in which the effect of machinery upon labor was discussed and the single tax extolled. He concluded by saying that in the field of inventions California holds a pre-eminent and honorable place, and her position in this respect is very largely due to the stimulus and encouragement given to inventive genius by the Mechanics' Institute of San Francisco.

The arts, manufactures and natural products of the State are finely exemplified at the Pavilion. There is much to interest the intelligent visitor, and any of our readers visiting the city will find there considerable of practical value. The exposition will be open till the 14th of next month.

A Letter from Mr. Ford.

TO THE EDITOR:—In view of the incomplete, and, therefore, misleading newspaper accounts of the meeting of the executive committee of the California Miners' Association last Friday evening, and in view of the published interviews contained in the papers of Sunday morning concerning the same meeting, I thought possibly a line from me might help to correct some erroneous impressions and contribute to a better understanding of the aims and purposes of our State Association.

The Association had its origin in the depressed condition of the mining industry consequent upon the suppression of hydraulic mining. Our gold output had been reduced about ten millions annually and the result was appalling, causing the abandonment of millions of dollars' worth of property, throwing thousands of men out of employment, and, in many instances, depopulating whole neighborhoods. A most bitter and hostile feeling grew up between the farmer and the miner and all hope for an amicable adjustment of the controversy seemed to have gone by. Then came into existence the California Miners' Association, which sought to proceed upon lines of fairness and to appeal to the good sense of the broad-minded citizens of our great State. The result was a source of both surprise and gratification. The weight and influence of the Association were at once felt in our State legislation, while the National Congress listened with respectful attention to our representatives. True, our progress was not rapid except in the matter of State legislation, which responded promptly to the call of the Association for legislative relief, but we felt an encouragement that had for many years been absent. There had also been some difference in opinion as to the shape congressional legislation should take, and, I confess, I was one who thought we might have proceeded on somewhat different lines; but these were differences which could, and doubtless would, have been harmonized after free and friendly discussion.

Then came the matter of the preservation of the mineral lands of the State, and to this subject the Association gave prompt and vigorous attention. There never has been, nor is there now, the slightest difference among the members of the Association as to the result desired, though there has been some difference as to the best method of obtaining that result. Those of us who had stood the brunt of the battle in the fight for the rehabilitation of hydraulic mining felt that we should use due care not to lose the ground we had gained in that contest, for we realized that there was much yet to be done, if not some things to be undone, before the mining industry of this State would be able to regain the position it once held and which its importance justifies. At several meetings of the executive committee of the Association suggestions had been made that a committee be appointed to confer with representatives of the railroad company and ascertain what could be accomplished by way of an arbitrament of the mineral land question. At the meeting of last Friday evening these suggestions took the shape of a motion providing for the appointment of such a committee. The motion was carried without a negative vote and the committee was appointed. Later in the evening, I regret to say, a discussion arose that developed into a debate characterized by some acrimony, and I must confess that it was not wholly free from bitterness of feeling. The prior action of the committee directing the appointment of a conference committee was reversed, and the committee on mineral lands was authorized to take appropriate steps toward a proper adjustment of the pending controversy touching mineral lands.

That this controversy may be speedily adjusted is certainly most desirable, and that the Association has appreciated the work thus far done is evidenced by the strong moral and financial support already extended to the committee on mineral lands. This committee has evinced much enterprise; and now that it is clothed with full power to act in the premises, we may hope for an early and a satisfactory settlement of the mineral land question.

This question once out of the way, the Association will be again in position to take up the cause that called it into existence, and, with intelligent, united effort, there can be no doubt as to the result.

Differences will always arise where any number of men are associated together, and we must not expect the Miners' Association to be an exception to the rule, and whatever of intense feeling may have been displayed at last Friday's meeting, let us take as an earnest of devotion to the cause and the anxiety of enthusiastic minds. I can see no reason why the Association should not wholly succeed in its laudable mission, and that it may do so I most earnestly pray, and to its accomplishment I shall unhesitatingly and unreservedly devote in the future, as I have in the past, the full measure of whatever of ability or influence I may possess.

Sincerely yours, TIREY L. FORD.

San Francisco, Aug. 13, '95.

Concentrates.

LOS ANGELES, Cal., and Prescott and Phœnix, Arizona, urge the establishment of mining exchanges.

THE value of the ore shipped from the mines of Kootenay for the twelve months ending June 30th, '95 was $1,491,811.

THE Derbec mine at North Bloomfield has finally closed, being worked out. The pumps were pulled up last Saturday and no more work will be done.

IT is figured that it will be September 1st before the water is all pumped out of the Utica mine at Angels. The mill is running on ore from the upper levels.

SEVERAL mining claims have been taken up at the mouth of the Salmon river, Idaho. The diggings are said to be similar to those at Gold Beach, Coos Co., Or.

GOLD BULLION can be assayed at the San Francisco Mint, but no ore. The only federal institution allowed to assay metal ore of any kind is at Charlotte, N. C.

THE Toltec Mining Company is organized at Phœnix, Arizona; capital stock, $200,000. Directors: D. M. Purman, J. H. Hunter, A. E. Martin, T. A. Orr, W. Webster, Phœnix, Ariz.

THE Bear's Nest mine, on Douglas island, which was recently reported as salted, is now being surveyed and thoroughly prospected. According to recent reports there's nothing in it.

A YEAR AGO Boston & Montana stock was plentiful on the Boston market at $26 per share, and some could have been had at a lower figure. Recently it was quoted in Boston at $81—a rise of $55.

THE Rebeka Mining and Milling Company has incorporated in this city. Capital stock, $500,000; all subscribed. Directors: John A. Paul, Moses Alder, Sanford Sachs, Aaron A. Adler and Samuel I. Sachs.

A BIG GOLD STRIKE is reported at the Carbonate mine, Oro Grande district, San Bernardino Co., at the depth of 200 feet. The mine is owned by Moulton, Fleming and Robinson of Los Angeles, and is said to show extraordinarily rich ore.

IT is a common occurrence at the Mint in this city to have a foreigner, visiting here, bring his gold to have it recoined. The charge is only $1 for 1000 ounces, which is virtually nothing at all, making it much cheaper than exchange.

AT Calico, San Bernardino Co., the Silver King Mining Company is reported reducing about 100 tons of ore daily. Its mines are the Oriental, Bismarck, Odessa and Occidental. It is stated that there is ore enough in sight to keep the mill occupied two years.

PROF. JACKSON, of the Nevada State University, is erecting a cyanide plant at the lower end of Silver City, Nevada, below the Dazett mill, for the purpose of working the tailings that have accumulated there for some years past. The tailings have been bought by the professor.

THE total exports of gold from Western Australia for the year ended June 30th, '95, was 239,593 ounces, valued at £910,426, an advance upon the value of the export for the year ended the same month of 1894, which was £560,263. For the six months ended June 30, 1895, the total output was 108,280 ounces, worth £411,465 6s 5d, and for the six months ended June 30, 1894, the yield was valued at £288,210. The total export of gold for Western Australia to June 30, 1895, is 563,128 ounces, valued at £2,139,809.

THE Minersville Hydraulic Gold Mining Company has organized at Wenverville, Trinity Co. Capital stock $1,200,000. Directors: Fred Beaudry, Weaverville; E. Cumenge, Paris, France; Count G. de Kergorlay, Minersville; E. Saladin, Junction City; H. Dugervey, San Francisco.

THE War Eagle gold mine at Trail Creek, British Columbia, affords a striking illustration of fortune quickly realized. The bedrock price of the stock was about six cents, the mine itself costing less than $30,000, but it has already paid dividends of $150,000. The shares are quoted at $2.50 each, and the mine is in better shape than ever.

THE Idaho Gold Mining and Smelting Co., of Butte, has been organized; principal place of business operations will be at Trail Creek. The company is capitalized at $500,000. The Center Star Mining and Smelting Co., of Butte, also organized, to carry on a general mining, smelting, milling and reduction business at Trail Creek; capital stock, $500,000.

THE Nogales, Arizona, *Oasis* says the turquoise mine in Cochise county is doing well. The product commands $8 per carat, equal to $11,360 per pound, in the New York market. A shipment of thirty pounds is about to be made. Assorting and cleaning will reduce the weight somewhat. There is only one other turquoise mine in this country, and that is in New Mexico.

THE Portland, Or., *Oregonian* of the 7th inst. has a detailed and circumstantial account of the finding in a California watermelon of "streaks of pure gold," which by nature's subtle alchemy had been transmuted from the auriferous soil in which it grew. Next thing we know the nuggets found in the gizzards of Oregon chickens will be reported larger than usual, and another gold quartz ledge will be reported in Oakland.

IN explanation of last week's shipment of $10,000,000 in gold bullion from New York to Philadelphia, Director of the Mint Preston says that it is the present purpose of the Government to coin with reasonable rapidity all of its stock of gold bullion. This amounts to nearly $60,000,000, about all of which is in New York, Philadelphia and this city. There is said to be no special significance in this order for the coinage of gold bullion, it being solely for the purpose of making it available for all purposes.

REGARDING the sale by the administrators of the Fair estate to Pierre Humbert Jr. of Boston of the estate's one-half interest in the Pioneer mine, in Placer county, suit is to be brought to partition the mine between the estate and A. E. Davis, owner of the other one-half. Humbert agrees to bid at the partition sale a sum which will yield the estate $72,500, and to secure his promise has made a deposit of $75,000 with the First National Bank. Should Humbert fail to carry out his agreement, the $75,000 is not to be returned until he shall indemnify the Fair estate for all loss or damage sustained by reason of his breach of contract. The mine has yielded $381,800, and is considered cheap at $150,000.

THE Slate creek, Wash., boom is burst. The Montana syndicate spent $50,000. They wanted the country thoroughly prospected. They were on the ground and if any finds were made and there was a permanency to the country they had the money to bond the mines and secure control of the property. As a result, 3000 prospectors went into the country and every foot was gone over. All of the locators were anxious to give the syndicate long-time bonds on their locations, and the extensive development work done on the Eureka showed that the mines could not under existing conditions be worked successfully and they withdrew. Everything is at a standstill. Work has ceased, and few people are left in the country. There is plenty ore, but it is too low grade.

RECENT Colorado mining incorporations are the Enterprise Gold Mining Company of Pueblo, incorporated by B. Donahue and Frank Clink; capital stock, $100,000. The Atlantic Mining and Milling Company, incorporated with $1,000,000 capital stock, to operate in El Paso county; incorporators, F. Buck, F. A. Morath and C. Newer. The Hudson Gold and Silver Mining Company; capital stock, $1,000,000, to operate in Crystal, Gunnison county; incorporators, B. S. Phillips, L. H. Pike and G. C. Eaton. The St. Paul Gold Mining Company, at El Paso, with offices at Manitou; J. O. Hardwick, A. G. Lewis and W. H. Rogers, incorporators; capital stock, $100,000. The Colorado Gold Mining Company; capital stock, $100,000, Denver; incorporators, C. Bleibel, P. Feldhauser, M. Barth and O. Sauer.

THE Trail creek miners have concluded 'tis useless to strike for $3.50, and now claim to have discovered that the Canadian law provides a method of arbitrating differences between labor and capital. As a result, the Commissioner of Conciliation and Arbitration of British Columbia has served notice on the mine owners in the Trail Creek district that the miners desire arbitration on the wage question. It is said the miners will seek to prove at this conference that the mine owners are able to pay $3.50 per day; that the mines are yielding big profits; that the cost of living is greater than in the camps on this side of the line, and that, in view of the fact that $3.50 is the standard wages in Montana, they ought to be paid that much. If the mine owners can afford to pay $3.50 they will; if not, they will shut down, as in the Cœur d'Alenes and elsewhere.

IT will be necessary for the people of South Africa to hunt up some new mines at no very distant day in order to keep up the excitement in regard to that country. The mines at Johannesburg are what would in California be called drift diggings. The pay lies in the gravel on and near the bedrock. This pay streak of cemented gravel averages about three feet in thickness. This small streak is all that contains pay, though there are hundreds of feet of gravel and other material above. The pay streak is fast being drifted out. Little pay is left even now in some of the older claims near the edges of the basin. It is for this reason that the English in London are trying to work off the stock of several mines among the French in Paris. As the rim of the basin in which the gravel deposit lies descends at an angle of about 70 degrees, depth is rapidly attained. Surveys show that the flat bottom of the basin lies about 5000 feet vertically below the surface. That will be a great depth to go for a three-foot streak of low-grade gravel. Of course the bottom of the old lake basin may lie at even a greater depth.

Mineral-Bearing Veins.

"Under the general terms of 'ores' is comprehended all minerals and mineral aggregates which, from their metallic contents, attract the attention of the miner," says a leading mining authority. The idea of "ores" and "metalliferous deposits" cannot be expressed in a more precise manner. Under this head, indeed, are included all native metals, metallic oxides, metallic sulphides, and even metallic salts and their combinations. "Lodes" are aggregations of mineral matter in fissures in rocks. The fissures are the result of volcanic or plutonic action. The rock in which a mineral vein or lode occurs is called the "country rock," or "wall rock." The sides next to the vein are called the walls. When the vein is not perpendicular the wall over it is called the "hanging wall." The extension of a lode in a horizontal direction is called "the strike," and the angle which it makes with the plane of the horizon the "dip." The "outcrop" is that portion of the vein which appears above the surface.

The breadth or size of veins varies greatly. Some are no thicker than a sheet of paper, while others are several hundred feet thick. As a rule, most payiug veins average from six inches to five feet in thickness. The grout in which the Comstock lode is formed is iu some parts several hundred feet iu width. All the filling within this fissure was not "ore," however, there being much quartz, clay, porphyry and other barren material called "vein matter," which contained but a small percentage of the precious metals. This is generally the case in all mineral veins of great width.

As a rule, says Dan De Quille in the Salt Lake *Tribune*, lodes occur associated together, so that when one lode has been discovered there is a great probability that others of a similar character—be they gold, silver, copper, lead or iron—will be found in the same neighborhood. The lodes are generally arranged in groups approximately parallel to one another. Mineral veins are usually found in regions in which igneous rocks have burst through crystalline schists or stratified deposits. In a general sense they belong to the contact phenomeua of igneous rocks; that is, to places where the igneous rocks are in "contact" with those of a sedimentary uature, in consequence of which they are much more frequent iu mountainous regions than in plains, since the upheaval of igueous rocks has commonly caused the elevation of mountains, either directly or in consequence, and the upheavals have generally been through stratified rocks.

But all lodes are not found iu places where igneous and sedimentary rocks are in contact. Sometimes the veius are situated between two igneous rocks of a different character. Lodes occur more frequently iu rock formatious of great age than in very recent ones. Certain classes of them, as the lodes of tin ores, are found only in the oldest rocks. Thc tiu deposits in the Black Hills, those in Cornwall, in Australia, and in the Temescal mines in Califoruia, are all in the oldest of the igneous rocks. The more recent the formation of the igneous rocks so much the more rarely are they accompanied by lodes, the very recent only by lodes of iron ore. Miueral veins of value are hardly ever found in recent volcanic deposits. It may be said the greater the age of rocks and formations so much the more frequently are they, as a rule, traversed by lodes. However, if we collect all the facts in regard to the age of lodes in general, or in separate classes of them, we shall find there is no limitatiou of their origin to particular geological periods.

If the same age should be ascribed to all bodies similarly composed it would follow that all auriferous bodies should be cousidered as belonging to the Tertiary, or a still more recent period, and a large class of silver lodes as being younger than some deposits of the Cretaceous. Such a supposition cannot be strictly refuted, but it does not coincide with the general occurrence of such lodes. It appears more natural to assume that the formation of various kinds of lodes has been taking place at all periods siuce the crust of the earth has existed, but at various depths. Whether generally in thc same or in a decreasing ratio must, as being undecided, remaiu questionable. And further, that this has taken place, now in this, then in that district, according to circumstauces conditioned by general geological events, as a consequence of which the older rocks and deposits more commouly coutain lodes than the recent ones, which were not so long subjected to the possibility of lodes being formed in them.

Were various lodes forming during all periods of time, but at unequal depths, it would then, as just remarked, be easily compreheusible that the oldest rocks and formations were commonly most affected by this continuous event, being longest subjected to it.

It is just as comprehensible that the kinds of lodes belonging to the greatest depths can only become accessible to our observation and to mining where what was ouce deep in the interior of thc earth has reached the surface by upheaval and erosion of what lay above it. A longer period, as a rule, was necessary to raise such deep inner regions to the present surface of the earth, and to destroy the mass lying above them, than for the less deep formations. It is, therefore, very natural that the lodes formed at the greatest depths should appear to be relatively the oldest, precisely because the most time was necessary to lay them bare, which could but seldom be replaced by greater energy of uphcaval and erosion. Thus it is supposable that the formation of all kinds of lodes is still taking place, but the majority generally at such depths that we cannot observe them, and different kinds of unequal depths.

Since, as was stated at the begiuning of this article, all true lodes are aggregations of mineral matter in fissures, fissures must necessarily have first been formed and then filled. Both operations may have been independent of each other, and even when this is probably not the casc, still the formation of the fissures was an entirely different operatiou from that of their being filled with mineral matter.

Even the purely mechanical operatiou of the formation of fissures has been explained in very different ways. Werner considered fissures to be in consequence of compression caused by specific gravity, by the drawing off or separation of the rocks in the directiou of the exposed side, by the contraction caused by drying, and by concussion caused by earthquakes. Fox explained them as being consequences of electrical currents in particular directions, and on this account thought they were originally formed at nearly right angles to the direction of the magnetic meridian. Others have considered them to be consequences of the cooling of the globe.

While it must be granted that fissures could have been formed in all these ways, and perhaps really have been so formed ever since the earth had a solid crust; while in this it may further be granted that a fissure formed in this manner has been exceptionally filled with minerals and ores, it is still more probable, as Van Buest in his criticism of Werner's theory has clearly shown, that the majority of lode fissures have been torn asunder by concussions caused by volcanic or plutonic activity, or, in other words, by volcanic or plutonic earthquakes. Even at the present time earthquakes produce eutirely similar fissures, which are frequently formed in groups, like those of lodes; and in so far as they are caused by a similar concussion, run parallel to oue another.

Many vein fissures have probably been repeatedly torn open, or have been widened during the process of filling. This last operation seems sometimes to have taken place as a consequence of the expanding process of crystallization in the lode fissure.

The manner in which lodes were filled is a subject in which hypothesis still has free scope, and which must be treated, as far as possible, in a manner guided by the limits of observation as well as by the application of known laws. It is now conceded that the majority of mineral-bearing veins are formed either by sublimation or infiltration, very few persons at present holding to the old theory of the injection of molteu matter. Indeed, Plattner, Daubree, Durocher and others have not only succeeded in producing quartz artificially, but also the ores of iron, lead, antimony, silver and several others. This was done through sublimation by heat aud condensation in a proper receptacle. Hot miueral springs are important assistants, if not indispensable requisites, in the formation of mineral veins. At Steamboat Springs, Nev., a large mineral vein is undoubtedly in process of formation. So slow is this process of formation, however, that to have produced a lode such as the Comstock must have required ages almost beyond computation. At one time, ages and ages ago, the hot waters found in the Comstock lode at a depth of from 1000 to 1500 feet must have reached the surface along the line of the vein. Ages ago the subterranean fires and forces directly beneath and about the great lode were much more active than anything of the kind at present in existence in or about any hot spring in the country. The upheaval of the vast mass of syenite forming Mount Davidson must have brought up to near the surface from the depths intense heat that endured for ages. There are indications that the mountain did not come up at once, but by several impulses, with probably thousands of years between each. Thus at each upward movemeut there would be a new accession of heat and fresh and broader rents in the superiucumbent propylite iu which the first fissurc of the lodc was formed—that along which croppings appear.

All lodes have not, however, been formed in the same manner. Not a few show that they owe their existence to aqueous solutions, while iu others evidences of condensatious from sublimations of gaseous emanations predominate. In great veins, such as the Comstock, there are nearly always to be found proofs of the work of formation and filling having been done at widely different times, as well as through different agencies, aqueous forces being at one time in the ascendancy, and the gaseous, with sublimations from great and deep-seated heat, predominating at another.

Besidcs all this, all mineral lodes are subject to transformation after formation. Nearly all, therefore, have reached our age after having passed through a variety of influences. Aqueous deposits have been rent open aud changed by plutonic forces, and by receiving additional deposits from sublimatious, or by aqueous precipitations and infiltrations. Evidences of all these different modes of deposit are to be found in the Comstock lode. It has several times been opened and reopened in parts under widely different influences and conditions of subterranean pressure aud volcanic or plutonic disturbance.

To say nothing more about the formative process by which the Comstock was filled and mineralized, there is evidence that some of the forces through which the production of the lode was effected are still in operation. The internal fires beneath the earth's crust are still active, heated water is still being forced up and put in circulation among the rocks as a solvent, and the rocks themselves are kept at a high temperature, which, as all chemists know, is favorable to condensation by crystallization. As the machinery in the workshop is still in operation, it must be that some work is being done. The progress of this work, however, may be so slow as to be almost imperceptible, and incapable of computation through measurement, unless a special study of it should be made, extending over a great number of years—perhaps from generation to generation of man and age to age of the earth.

Observations made in all parts of the world have shown that deposition of ores is not only affected by the kind of rock forming the walls of a vein, but also by the accideutal conditions of that rock—as its roughness, smoothness, solidity and form, irrespective of its uature and components.

Aqueous vapors no doubt contribute most to the formation of quartz, aud gaseous and sublimated emanations from metals in fiery depths most to the formation of ores of the metals in connection with quartz, though much iu the way of mineral matter is doubtless deposited by chemical action from solutions of minerals in heated water.

What is seen on a small scale on the Comstock in the way of lode formatiou is to be seen in California on the western slope of the Sierra Nevada range, in the great "mother lode," on a scale of astonishing vastness and extent. There, by the upheaval of the granite mass of the Sierra, and the accompanying dykes of igneous rocks through slate and other stratified rocks, has been formed an auriferous lode that stretches along the western slope a distance of not less than 120 milcs.

Whether the Sierra range was thrust up to its present height by a single mighty convulsion or by a serics of upheaval impulses, the results would be the same; therc would bc made an opening between the rising igneous mass and the slates and other uplifted stratified rocks similar to that made on the Comstock between the syenite of Mount Davidson and the propylite which it lifted.

All fissures have not been formed by the obtrusion of igneous rocks; some are due to the shrinkage of the crust of the earth, while others have been formed in ways already mentioned. However, the first requisite to the formation of a mineral lode is the fissure, and thc second is that the fissure shall reach down to heated regions where exist miueral-charged vapors and gases—a subterranean laboratory in regard to the naturc of which all is mere conjecture.

Upward through such a fissure would pour from deep-seated, heated regions the vapors of miuerals, mineralized gases, and, probably, in the first stages, great quantities of hot mineral-charged water, and thus would be commenced the work of filling the fissure—the formation of a mineral lode.

The Wet and Dry Seasons in California.

To the Editor:—The periods of the year in California are more generally spoken of as the wet and dry seasons rather than by the name of one of the four seasons in vogue in the greater portion of the world. The term "wet" does not in this sense mean continuous wet, nor does the term "dry" mean no rainfall. They are used in a comparative sense and mean, the wet season that rain is more probable, and the dry season that no rain is more probable, than the reverse. This paper is based entirely on the rainfall at San Francisco, which is very close to the mean between the heavy and light raiufall of the State; hence it represents very largely the whole State. Rain has fallen every month of the year at San Francisco. August has a mean rainfall of 0.01 of an inch, July 0.02, September 0.22, June 0.25, May 0.73, October 1.25, and the other months have averages of from 2 to 5 inches. From May 1st to October 1st, five months, have an average rainfall of 1.23 inches, and the remaining seven months have an average of 22.70 inches, making an annual average of 23.93 inches.

The First Rains.—At the present time, August 1st, we are in the middle or a little past the middle of the dry season, and it will not be long until many will be making inquiries as to the commencement of the rains. Cousidering the record of the past twenty-five years, made in this city by the United States Weather Observer, it is found that the average date of first 0.05 of an inch of rainfall occurs by September 17th. Considering June 30th as the official end of one season and July 1st the commencement of the next season, we find that the earliest date of 0.05 of an inch of rain is July 8, 1885, and the latest October 27, 1875—that is, from July 1st to October 27, 1875, only 0.05 of an inch of rain fell. As 0.05 of an inch of rain is such a small amount, it has been deemed best to consider that when one-quarter (0.25) of an inch of rain has fallen that that date be

considered the commencement of the rainy season. Using this then as a basis, we find that the rainy season begins on October 8th. The earliest date of a quarter of an inch is September 8, 1884, and the latest not until November 23, 1880.

As one-quarter of an inch of rainfall at San Francisco is hardly sufficient to allow of rainfall over the southern portion of the State, a basis of one inch at San Francisco was considered for the southern portion as the commencement of the rains there, and this is found to be November 1st. The earliest date of one inch of rain is September 15, 1888, and the latest December 3, 1890.

One inch of rainfall at San Francisco is not sufficient for the interior of the State to allow of good plowing and seeding; hence a total of 2 inches at San Francisco was considered, and it is found that 2 inches of rain falls at San Francisco up to November 1st; hence that date can be said to be the date of commencement of good plowing.

Five inches is cousidered as the rainy season being here in full effect, and it is found that 5 inches does not fall before December 15th, and that the earliest date that 5 inches has fallen is October 21, 1889, and the latest February 5, 1891. In this latter season February was very wet, and the total for the season was 17.58 inches.

To summarize, we have first rains September 17th; rainy season begins October 8th, and in southern portion of State November 1st; ground moisteued for plowing November 13th, and rainy season in full effect December 15th. These facts have not been presented heretofore and may be found of interest and value to many, for they show the average of the past twenty-five years. The greatest seasonal rainfall at San Francisco was in '89-90, when 45.85 inches fell, the least being 11.04 inches in '76-'77.

Why We Have Wet and Dry Seasons.—In this connection the causes of these seasons and the cause of this great variation in the amount of rainfall may be of interest. The amount of rainfall in California is dependent upon the north or south deflection of the storm areas. The food of a storm is heat and moisture. With the approach of the summer months the heat is increased, and with this increase of heat the moisture becomes less, hence the storm areas retreat northward to obtain their greater supply of moisture. As the storm areas seek their more northerly path the rainfall over California becomes less and less, and with the passing of the summer heat the path of the storm area moves southerly and the rainfall then increases.

The normal path of storm areas across the Rocky mountains from November to April is about the 50th degree north latitude, and when the path is south of this latitude the rainfall over California is increased; when to the north it is decreased. From April the path of the storm areas (areas of low barometric pressure are called cyclonic or storm areas) moves northerly until July and August, when it is at its farthest point north, which is about or above the latitude of Sitka; from August they advance southward and the rain then begins in the north—in British Columbia—then in Washington and Oregon, and finally in California. The daily weather map is now distributed to nearly every town in California, and will be sent to more places, free of charge, if requested. By a study of the map, observing the progress and course of the storm areas, marked "Low" on the map, the public can form very good ideas as to the approach of the rainy season. So long as the "Low" is not seen off the northwest Washington coast there need be little or no fear of rain in California, but when it appears there then rain over California is probable and is made possible by the "Low" moving southward along the coast, the barometer falling over California and the winds backing or shifting to the south and southwest.

South Winds and Rain.—Rain in California, unless it is a local shower, seldom occurs with winds from any point of the compass except the south, southeast or southwest. This has caused the idea among some that the rain came from the south. This is an error. The causes which produce the rains come from the north, though the winds are southerly. The air is light and with an upward movement, like the draught up a chimney. In a storm center the air from the surrounding sections moves spirally inward to fill up this lightness or hollow in the atmosphere. As storm areas move southward along the coast from Alaska and cease their southerly movement about the Columbia river, the wind to the south of the storm centers are southerly. They blow into the storm area, give it more food or energy, and the influence of the storm is extended southward, allowing the rain to fall over California. The more extensive the storm area and the greater the depression of the barometric pressure the greater will be the area covered by the rain and the stronger will be the force of the wind. From this brief explanation it can be seen how valuable are the weather maps, even though they reach the recipient thirty hours after they have been issued from this office. In the summer months the storm areas are so far to the north that their influence cannot extend so far south as California, hence the dry season; and the longer the storm areas remain in their northern location the longer will be the dry season.

Heavy and long continued rain periods over California are caused by the greater diameter of the storm and a resistance or barrier in the path of the storm which prevents its easterly movement. This barrier is an area of high barometric pressure over and to the north of Montana.

The foregoing is a brief outline of a subject which, if thoroughly treated, would make many pages, which would be too long for general distribution. It is hoped, however, that this may give a fair understanding of the subject.

B. S. PAGUE,
Weather Bureau Office, Local Forecast Official.
San Francisco.

Mining on the Colorado.

TO THE EDITOR:—Mining along the Colorado river is taking on new activity and awakening an interest among mining men never experienced before in this section.

The old Figueroa mine at Pot Holes has been sold for $35,000 to Davis, Wetmore & Co., who will erect a ten-stamp mill on it. The shaft is down 70 feet; vein 4½ feet wide in good ore. A mill will be put on the Dahlonega mine at Buena Vista, four miles above Pot Holes and sixteen miles above Yuma, by Beatty & Co. It is owned by San Francisco parties.

The new discoveries at the Delgado ranch, opposite Buena Vista, on the Arizona side of the river, continue to look well. Mining capitalists have plans in hand for the erection of a large smelting plant at Castle Dome for the reduction of the lead and silver ores from the mines in the Castle Dome mountains, twenty miles east of the Colorado.

In the Picacho White Gold Basin, on the California side of the river, the prospects are most flattering. Wherever the mines have been opened it has been with good results. The Gold Chain mine shows a solid face of $10 ore sixteen feet wide with but one wall in sight. The Gold Prince shows from ten to fifteen feet of good ore. The Jaeger mine at forty feet in depth shows a vein four feet wide. The work on the Silver King now being done by Adams & Curtis shows a vein of ore from sixteen to twenty feet wide which runs well in gold, silver and copper. This is the first mine of this kind carrying these metals in combination found on this side of the river in the White Gold Basin. The owners are now sinking a shaft on the vein which is opening well. The Silver Queen and Walla Walla, both on the same belt, are showing up well. The ore is rich; veins fifteen to twenty feet wide.

The rich discovery made last week in the Picacho Basin, two miles west of the White gold mines, is considered the most important ever made on the Colorado river.

When placer gold was discovered at Picacho thirty-four years ago a large amount was taken from the surface of a belt of barren, bastard, dirty-looking quartz that reached across one corner of the basin, about 700 feet wide and 3000 feet in length. It was always a great mystery where all this gold could have come from, as the quartz was barren. Last week some placer miners struck a small but rich pay streak on the side of a shallow gulch, about twenty feet from the line of the famous old Mars mine, in ground always considered barren and valueless. It run in under the quartzite on the brow of the gulch and they quit it. Some quartz miners thought they would run an open cut across the top of the hill, and, beginning where the placer miners had stopped work, they soon found that at twenty inches in depth they had ore that would pay $5 to $8 per ton. Ten feet farther ahead and two and a half feet deep they had $15 to $18 ore. When they had run twenty feet and were three and a half feet deep the ore paid $25 to $30. They sunk a shaft at the end of the open cut. At ten feet the ore run $25 to $50, and from seventeen to twenty feet in depth the ore carries $50 to $150 in free gold, and growing richer as they go down. The croppings of this immense vein are more than 700 feet where it crosses the Mars mine, and the 3000 feet in length covers three or four other mines. This basin has turned out more than $7,000,000 in placer and $3,000,000 from its quartz mines, of which $2,876,510 was from the Mars, Venus and Goshen mines. It is now no longer any mystery as to where the placer gold came from. It was fine but rough just as it came out of the quartz. The new find now shows a body of ore twenty feet in depth, growing richer as depth is attained, and twenty feet in width, showing neither wall nor signs of any. The ore is a fine-grained, rose-colored quartz, very easily crushed. The discovery adds great value to mines heretofore considered of no great importance and sends the Mars and Venus group up to severe figures in value.

The Gold Rock mines, near Ogilby, continue to hold the field as gold producers. The forty-stamp mill still gets away with its 100 tons of ore per day. The new 100 stamps will soon be ready for work. The mine is down 400 feet with $10 ore in every direction for 100 feet, and no walls nor signs of any; promises to be a bonanza for years to come. It is not to be wondered at that those who were offered this valuable property less than three years ago for $12,000 should now smite themselves on both cheeks for their ignorance of what a good mine should consist. It is not the first time they have done so. No less than a dozen other good mining claims have changed hands in this section within the past three months. The Old Blossom has been put on its feet again and promises to enter the ranks of the best gold producers in this section. Three large mills are already contemplated for this district during the coming winter.

With these and the four or five new mills that in all probability will be put into the Picacho and White Gold Basins, the coming fall and winter, together with those at Pot Holes and Buena Vista and the southeast corner of California, the great free-milling gold belt of the State and of the Colorado river will come into prominence as one of the great gold-producing districts of the Pacific coast, in which the chances to-day of securing promising claims and undeveloped properties are the best that I have seen for years.

Messrs. Koumtze and Shoedy, the Denver, Colo., mining capitalists, have done 186 feet of shaft work on the Ararica mines on the California side of the river, twenty-two miles west of Ehrenberg, with promising results. It is reported that they will put up a large mill on the river for reducing their ores. The outlook along the Colorado from Yuma up never was as promising for mining as at the present writing.

E. M. G.

Ogilby, Cal., Aug. 1, 1895.

Cyanide or Other Chemical Proportions for Laboratory and Mill Workings.

(100 PER CENT PURE.)

SOLUTIONS OF ONE PER CENT.		Chemicals for ONE POUND ore or water, 437½ grs. to oz., 16 ozs. to lb.		Chemicals for ONE TON ore or water, 16 ozs. to lb., 2000 lbs. to ton.	
Fractions of one per cent.		Grains.		Pounds.	Ounces.
	1/320	.....	7/32	.....	1
	1/160	.....	7/16	.....	2
	1/80	.....	7/8	.....	4
1/64	.....	1	3/32	.....	5
	1/40	1	3/4	.....	8
1/32	.....	2	3/16	.....	10
	1/20	3	1/2	1	.....
1/16	.....	4	3/8	1	4
	2/20	7	.....	2	.....
1/8	.....	8	3/4	2	8
	3/20	10	1/2	3	.....
	4/20	14	.....	4	.....
1/4	5/20	17	1/2	5	.....
	6/20	21	.....	6	.....
	7/20	24	1/2	7	.....
	8/20	28	.....	8	.....
	9/20	31	1/2	9	.....
1/2	10/20	35	.....	10	.....
	11/20	38	1/2	11	.....
	12/20	42	.....	12	.....
	13/20	45	1/2	13	.....
	14/20	49	.....	14	.....
3/4	15/20	52	1/2	15	.....
	16/20	56	.....	16	.....
	17/20	59	1/2	17	.....
	18/20	63	.....	18	.....
	19/20	66	1/2	19	.....
1 per cent	20/20	70	.....	20	.....

If preferred for ready use, keep a gallon or more of *one* or *two* per cent solution on hand, under glass stopper, and reduce as required, viz.:

To reduce one per cent solution to—

3/4	of one per cent,	use	3	ozs.	solution	to	1	oz.	water.
1/2	"	"	"	2	"	"	"	2	" "
1/4	"	"	"	1	"	"	"	3	" "
1/8	"	"	"	1	"	"	"	7	" "
1/16	"	"	"	1	"	"	"	15	" "
1/32	"	"	"	1	"	"	"	31	" "
1/64	"	"	"	1	"	"	"	63	" "

Ask dealer the percentage of chemicals, and if not 100 per cent pure, add to the solution for each one per cent deficiency, 1 grain for every 100 grains, or 1 pound for every 100 pounds used, keeping strictly to the standard for correct results.

A. H. JOCELYN,
N. Y. Daily Financial News.

Mining Summary.

CALIFORNIA.

Amador.

THE DOYLE AND ANITA.—*Republican:* J. B. Doe of San Francisco and W. Moore of Sonora have bonded the Doyle property in Hunt's gulch for two years for $35,000, with the option of taking the mine for $25,000 by paying the whole of that amount in nine months. The bonders have to pay the owner, W. Doyle, $75 a month during the life of the bond, which payments will be credited on the purchase price in the event of a sale being consummated. Work is to be commenced within sixty days from the execution of the agreement. It is the intention to sink a shaft to a considerable depth and give the property a fair exploitation, and if this can be done there is every reason to believe that it will develop into a paying property.

ANITA —The ledge which is being followed north and south on this claim at the depth of 200 feet has widened out to six feet. The company will proceed with development work. The ore body is wider at the floor than it is at the roof of the drift. This shows that the apex of the vein has been encountered, and furnishes ground for the belief that the ledge will show up much stronger when greater depth is reached.

Butte.

AROUND MAGALIA.—An incline has been sunk in the Aurora to bedrock and a tunnel is being run to tap the old works. This tunnel will be forty feet in length. As the old works are filled with water it is a dangerous operation to tap them. Search drills are used for this purpose and these are run to the right and left as well as in front. As soon as the water is struck it will be drawn off in limited quantities so as to avoid danger. After the drills have been run a blast is put in and when the debris has been cleared out the searching again begins.

At the Magalia shaft it is thought that the machinery is not powerful enough to handle the pump and do the required work and a new plant may shortly be put in.

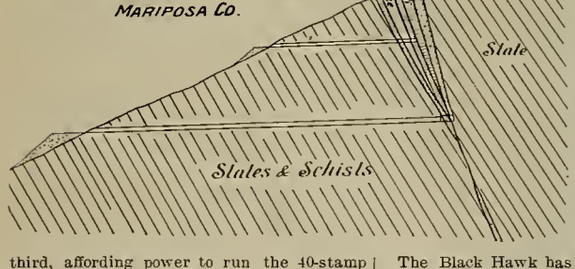
At the Alki mine they are pumping, putting in new pipe, erecting new buildings and getting things ready for operations. Messrs. Merry and Parry are the owners.

N. A. Harris is running a tunnel on the Wylie Bros. mine.

John. D. Williams is taking out good pay in the Golden Drift.

Mariposa.

AT HITE'S CAVE.—The Hite Gold Mining Company has put in a duplex air compressor; the ditch and flume have been enlarged one-third, affording power to run the 40-stamp mill. New hoisting works are building, and the mill is being put in order to crush ore. The mill is about 3000 feet from the mine and 500 feet below the tunnel level.



THE REDBANKS CO.—*Gazette:* The Redbanks Mining Company is building a dam and a large flume across the river and is pushing development work on the mines. About fifty men are on the payroll. A large amount of machinery and materials have been hauled in during the past ten days by way of Bear valley.

Nevada.

A FLOURISHING MINE. — *Transcript:* The cleanup at the Providence last month was the largest in the year. The mine is in a flourishing condition, and the owners are highly pleased with the outlook. Forty stamps are dropping continually, and the ore chutes are full. There is ore enough in sight in the stopes to run the mill for six months at least.

OUT OF DEBT.—*Transcript:* The cleanup at the Harmony mine yesterday was one of the largest ever made there. To-day the company paid off a mortgage and the property is now free from all incumbrances. Splendid gravel is being taken out right along, and very soon the stockholders will doubtless begin receiving dividends. The company have ground sufficient to last five years. From the developments made in the Harmony and West Harmony mines it has been demonstrated that the channel extends up the ridge, and it is only a question of a short time when work will be started on the different claims that are located along the ridge.

A NEW 20-STAMP MILL.—*Union:* Inside of a week's time men will be at work tearing down the old mill at the Wyoming mine, which adjoins the Champion and is owned by that company.

As quickly as possible the work of erecting a new 20-stamp mill will begin. The company has been figuring on this for some time and it will be gratifying to know that the work is about to commence.

Superintendent Zeitler is a zealous worker and will have things in fine shape at the mine when the new improvements are completed. At present the company has thirty stamps dropping night and day, and when the new mill is completed there will be fifty stamps.

Plumas.

LA PORTE AND GIBSONVILLE.—*National:* The Thistle shaft is now down 500 feet; 150 hands are employed. The company will soon begin operating on the Plumas side of the ridge, when a greater number of men will be employed.



PLAN OF THISTLE MINE WORKINGS.

From 1880 to 1892 the Pioneer mine at Grass Flat yielded $400,000. Since then it has paid better than ever. Dissen & Cowdery of San Francisco are the owners. Eighty men are employed in the mine.

The Alturas mine, owned by Packer & Hendel, has thirty men. The gravel deposits are on Slate creek and are worked by means of elevators.

J. H. Thomas has put three shifts of miners at work on the Clayhank tunnel, which will be extended 590 feet to develop the Gibsonville ridge channel.

A new tunnel 1000 feet long will be run on the South Fork mine, of which Mr. Bainbridge is superintendent.

Twenty-five men are employed in preliminary work on the Gold Bar mine.

Placer.

THE PIONEER MINE.—Forty-eight men are on the payroll of the Pioneer mine. The new tunnel, 520 feet below the present working tunnel, is now in over 400 feet. It must be run 1500 feet to strike the Pioneer ledge and a total of 2600 feet to strike the Linn vein of quartz. A new compressor has been put in to run the drills. The company expects to have forty additional stamps by the end of this year.

ON THE NORTH FORK.—The Boston company which purchased the Pioneer has completed the survey for a wagon road from Towle.

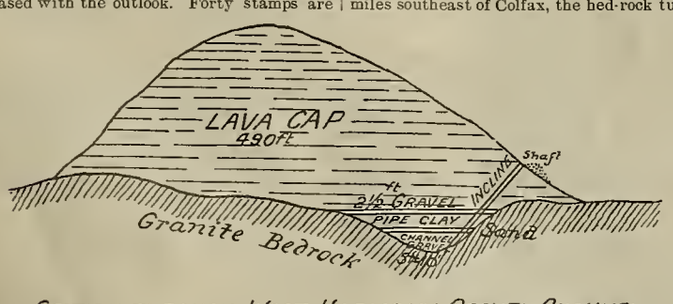
The Black Hawk has fifteen men at work under direction of Superintendent Blood. Goodall, Perkins & Company have secured a proprietary interest in a portion of this mine under an agreement to develop the property and erect a ten-stamp mill. The ledge is from 3½ to 7 feet in width.

E. A. Frenzel, of San Benito county, has a bond and two years working lease on the Dorer ledge. This mine now has 3200 feet of tramway and a ten-stamp mill located on the river below. Mr. Frenzel is backed by the Bank of Hollister. If the ore holds up to the present indications he will build a new tramway and commence operations on an extensive scale. Five men are at present working on the ledge.

GENERAL MINING NOTES.—At the Bonanza Slide Drift mine, two and three-quarters miles southeast of Colfax, the bed-rock tunnel is in 225 feet. A 10-foot breast of gravel has been struck. Thirteen miners are employed.

The Hidden Treasure Company has men retimbering the old tunnel at the Mountain Gate at Damascus.

The Hathaway mine at Ophir is leased by M. Jones, of this city, employs forty men and A. B. Eastwood is superintendent.



SECTION THROUGH WEST HARMONY GRAVEL CHANNEL, NEVADA COUNTY.

Riverside.

A SUCCESSFUL RUN.—*Record:* On Wednesday the Good Hope mill made a run on two tons of ore from Smith, Hamett & Hancock's Federal Loan mine. The ore was selected and taken from the pay streak of the ledge. The run netted 11 49-100 ounces of amalgam, which, at $15 per ounce, a safe estimate, gave a net result of $172.35. The owners of the mine a reconsiderably elated over the result of the run and will immediately put several men at work on the property developing and taking out ore.

AT THE SANTA ROSA.—Orders were given at the Santa Rosa mine Tuesday to begin sinking on the main shaft, and work will be pushed with zeal till a depth of 1000 feet is attained. Should the ledge hold out to that depth, and it is to be hoped that it will, it will settle beyond any question of doubt the permanency of mining in this district.

IRON MOUNTAIN DISTRICT.—The *Enterprise* reports the sale of several mining properties by C. H. Gray to Alonzo M. Wells. The mines sold are: The Arica, Red Butte, Lometa, Frixie, Gray Eagle, Alahama, Colorado, Washington and St. Louis, all located in the Iron Mountain district. The consideration is said to be $40,000.

San Bernardino.

GENERAL MINING NOTES.—The Lone Star Mining District is eight miles north of Leach's Point and about seventy miles from Daggett. Ore is reported found there assaying from $75 to $250 per ton.

The Holcomb Valley Company is running its dredges and amalgamators to only about one-tenth their capacity, owing to a scarcity of water. Superintendent Thame is sinking for water.

The Rose is shipping its high grade ore. The five-stamp mill is kept busy on the low grade rock.

MORONGO.—In the Morongo mining district, the Altura Mining Company has ordered a five-stamp mill which will be put up at once. The Morongo King Mining Company is still prospecting.

Shasta.

THE IRON MOUNTAIN SMELTER.—*Democrat:* About forty men are working at the site of the new Iron Mountain Company's smelter. The site is on a flat extending from near the Skillen place to the bank of Spring creek, and a little over two miles from Shasta. The workmen have already graded out and leveled up the old placer claim, and have about four acres graded.

Siskiyou.

GENERAL MINING NOTES.—The Fernandez Company, at Cherry Creek, have cleaned up this season's sluicing. The result is near $12,000—better than last year's cleanup.

The miners on the lower Klamath at Hamburg, Seiad and Happy Camp are doing well and expecting to realize considerable gold.

Eastlick Bros. and Wright & Fletcher, at Oro Fino, have made their cleanups from the past spring and summer work with hydraulic giants, with better results than last year. There is considerable snow yet on the highest peaks of the Salmon range to supply the ditches with water, but the hot weather causes it to evaporate almost completely before reaching the diggings, as the ditches are several miles in length.

The Horse Creek diggings, in Oak Bar district, will be worked right along, as the ditch is ready to furnish a good head of water for the giants.

Sierra.

THE GOLD BLUFF MINE.—Work has been resumed at the Gold Bluff mine, on the north fork of the North Yuba river, one mile above Downieville. Up to 1890 this mine produced $250,000. It was afterwards sold to a New York company for $100,000, and since then has yielded more than the purchase price. A twenty-stamp mill and other works were put up at an expense of $40,000. The property was levied on by the miners and other creditors. John Costa of Downieville was a large creditor and he bought in the other claims or liens and foreclosed on the property. He is now operating the mine, having twenty men employed and expects to make it pay, as there is plenty of good ore in sight.

THE LAST CHANCE.—Henry Goeriog, of Sierra Valley, who owns the Last Chance hydraulic mine, three miles above Mohawk, has his own water right, a ditch five miles long; has plenty of fall for the tailings, and has a new brush dam which has been accepted by the Debris Commission. The claim comprises 200 acres.

Trinity.

A PROMISING SECTION.—*Record:* At Minersville, in addition to the property now operating under the auspices of the French company, there are other properties which in all probability will sooner or later be worked on a large scale.

On the north side of Haywards gulch F. Bates has twenty acres of rich gravel; next adjoining are the forty acres belonging to Joe Kapusta; next to the last-mentioned are the ninty acres belonging to John C. Van Matre and Wm. Crandall; then there are 160 acres belonging to John C. Bolton, John Dodge & Co., and the Haywards Flat placer mines of 160 acres.

Where it has been drifted it has paid well. It could be worked by hydraulic elevators to advantage.

In one part of the flat about one-eighth of an acre cleaned up $1000. The average depth is about 60 feet, of which there are about 16 feet of gravel, which prospects from a few colors to 15 cents to the pan.

Van Matre & Crandall last winter piped down to a sediment about 25 feet above bedrock, and no lower.

The Bates claim has been drifted in places, and has paid as high as $80 for four hours' work. Inexperienced drifters have taken out $700 there in one week.

After $5000 had been taken out, the tailings were washed over and produced $350; the third washing paid $125, the fourth $60. This was done by Joseph Kapusta, the former owner, who sold it to F. Bates.

The Beaudry water right covers all of the above ground, where a pressure of 600 feet could be had if desired.

Owens, Waite & Co. at the bottom of their shaft obtained prospects of 28 cents to the pan, at the lower end of the flat in a straight line below the Bates claim. The bedrock is of rough slate.

It is estimated that an expenditure of from $80,000 to $100,000 would place 4000 inches of water all the year round with a good pressure on all the gravel benches from New River to South Fork. This part of Trinity county is worthy of the attention of capital.

Yuba.

RESTRAINING THE DEBRIS PERFECTLY.—*Democrat:* Among the small hydraulic claims compelled to cease operations some years ago was one owned by Steel & Co., at New York flat. This claim is about three miles north of Brownsville, a long distance from the river, and is worked on a small scale using about 300 inches of water and one small hydraulic monitor.

Steel & Co., received a permit to construct restraining works, which they proceeded to do and the work is of the best in the State. When finished the Commissioners approved it as being sufficient and all that the law requires. Since then it has been inspected by Lieutenant Gillett and Engineer Waggoner, assistants of the Commission, also by Mr. Boyd, an agent of the Anti-Debris Association, and each have reported that the dam is restraining the debris and dirt washed from the mine. The water after it leaves the dam is colored very little and when allowed to remain over night in a vessel no sediment is found.

RIVER BED MINING.—The Marysville Gravel Mining Company are making preparations for river bed mining. A large crew of men is employed. There is in place a fifty-horse power under-shot wheel which is intended to drive two large pumps and hoist the gravel from the pit and branch drifts.

NEVADA.

In the Savage, on the 950 level, west crosscut 1, started from the north lateral drift 106 feet north of the station, is advanced 68 feet; face is in clay and porphyry. The south lateral drift from the station is advanced 95 feet; face is in quartz and porphyry. In the east crosscut from the third floor of the old stopes they are extracting some fair-grade ore. On the 1050 level in the west crosscut from the face of the main south drift they continue to stope good ore. They are repairing the main south drift on this level. During the week they have hoisted forty cars of ore; car samples average $42.85 per ton. On the 11th inst. they commenced to ship ore to the Nevada mill and have now shipped 180 tons, aod the mill commenced crushing on the 13th inst.

The bullion statement of the Chollar mine for July is as follows: Worked at Nevada mill, 340 tons; gross proceeds in bullion, $7058.70; cost of reducing, $20.40; net proceeds in bullion, $5018.70; assay value per ton, $30.26; gross average per ton, $20.76; net average per ton, $14.76; mill worked up to 71 per cent.

STOREY COUNTY.

THE BRUNSWICK LODE. — The water-power plan at the Brunswick lode has been abandoned and two steam hoisting works, with engines of sufficient power to work to a depth of 1500 feet, will be built.

ESMERALDA COUNTY.

SILVER STAR.—The Hawthorne *Bulletin* says: The mines are looking better than ever before. The mill is still running on Ed Brown's ore. About a week ago he shipped a $12,000 bar, and he has as much more ready for shipment.

The Oneida is making regular shipments to the Kinkead mill, and the ore goes from $100 to $150 per ton.

The Nelson brothers have about 100 tons of good grade ore on the dump.

The mill at Douglass is not of sufficient capacity to handle one quarter of the output, and many of the mines have large quantities of ore on the dump waiting their turn.

LANDER COUNTY.

The Austin Milling Company, at Austio, has its mill running on a very fair grade of silver ore that, before the slump in metals, might have justified its shipment in native form to the market, but which now issues in the shape of concentrates. Twenty stamps are hammering away at present with plenty of ore in sight.

OREGON.

A SMALL STRIKE.—At Susanville another ledge is discovered in the tunnel being driven on the Cahell mine. The new ore vein is two feet wide and is good looking quartz. The tunnel is now in 600 feet, and it is expected the Cahell ledge will soon be tapped.

ON THE SANTIAM.—The first tunnel at the Santiam mines has been run in forty feet, and free gold ore has been struck. Considerable activity is apparent in the Santiam region, and the hills are being thoroughly prospected for new claims.

GENERAL NOTES.—A carload of quartz shipped from the Tolo Mining Co.'s ledge to Ashland produced $30 to the ton.

Capt. Brown has several samples of ore from the copper mines on Illinois river at his office in Grant's Pass, which assays 27 per cent pure copper and carries several dollars in gold. He is looking for smelting machinery.

Reports of rich gold finds come from the Siletz, and gold-bearing sand is reported found on the beaches near Tillamook. Sluices are being worked and good results reported.

Thirty men are at work on the Josephine County copper mine, some on the tunnel and some on the trail being built from Mudd ranch to Wheeler City. About 250 tons of ore are on the dump waiting the arrival of the

machinery, which will be taken in as soon as the trail is completed.

BAKER COUNTY.

GENERAL NOTES.—The Bonanza mine deal is off; others are trying to secure an option on the property. The owners are working the mine themselves, with monthly dividend.

There is a prospective sale of the Columbia mine on Fruit creek, owned by the Cabell Bros.

The North Pole Company at Cracker creek have started their mill on ore from the North Pole mine. Alexander Baring, one of the principal stockholders in the company, is on the way from London, England.

Times are lively at Bourne, and the E. & E. mines are running with full payroll and good returns.

At Granite a prosperous condition exists and the people are said to be very hopeful. The mines in the vicinity, both quartz and placer, are turning out well and capital is seeking investment there.

The La Bellevue mine is operating with a large payroll.

GRANT COUNTY.

QUARTZBURG MINES.—The formation of this country is granite, syenite and porphyry. There are about sixty claims located, and every location shows from one to three ledges. The veins vary in width from six inches up to eight feet. The value of the ore runs from $12 up to $250 in gold per ton. The oxidized ore extends down to about 100 feet below the surface. Below this depth the ore is more or less base. The value of the base ore is from $8 up to $250 per ton. Development work is being pushed vigorously, according to the means of the different owners.

The richest property in the district is the Present Need group. This property has considerable development work, showing well-defined ore chutes. The average value of the entire ore deposits so far as opened up is all of $100 per ton, all gold.

The Dixie group consists of twelve claims. A mill was started running on the 29th of last month on ore from the Cleveland mine, belonging to this group. This mine shows eight feet of ore in the breast of the tunnel. No cleaning has been made yet. In the Del Delta, belonging to this group, an upraise is being made from the 200-foot level, showing ten inches of ore.

IDAHO.

PAID ALL DEMANDS.—The Idaho Gold Reduction Company of Gibbonsville paid out $70,000 on their pay day last week, settling up in full every claim, says the Salmon City *Recorder*.

A FAMILY PARTY.—A mining party consisting of father and three sons, from St. Paul, Minn., are at Weiser. They have constructed a large boat, upon which they will place mining machinery as soon as it arrives at the depot. The apparatus is of their own invention, and when placed on the boat they will work up and down the river prospecting the bars.

IN THE COEUR D'ALENES.—The Bunker Hill and Sullivan mine and mill at Wardner is working 270 men, about seventy-five short of a full force. The company has all the carmen and shovelers wanted. It is working two shifts in the mine and one in the mill, and Manager Bradley says he expects soon to be working double shifts in the mill also.

Ten men are employed as armed guards. No trouble is anticipated from the union, but it is thought best to be on guard against possible depredations. Five or six men with rifles are kept on the flume, three or four are on guard around the works, and the same number patrol the tramway between the mine and the mill. The company is making regular shipments, and is accumulating ore in its bins. It is the practice of all the mines in the Cœur d'Alenes to work ahead with ore reserves, in order to allow the ore to dry out and avoid paying freight rates on water.

The Last Chance, which resumed operations after the decision in its favor against the Tyler, is working forty men, and running the mill with one shift, expecting soon to have a full force, when it will run double shifts in the mill. The Last Chance is paying the same wages paid by the Bunker Hill and Sullivan—$3 for miners, $2.50 for carmen and shovelers. Since the resumption of work in these two mines considerable development work has been done in various mines around Wardner.

ON CANYON CREEK.—On Canyon creek the Standard is employing 120 men and running two shifts in mine and mill. The new compressor is finished, and the company is about ready to put the drills into the new 3000-foot tunnel. The tunnel is now in about 100 feet, and when completed will be the longest tunnel in the Cœur d'Alenes. The company expects to go into the mountain at the rate of from 150 to 175 feet monthly. The entire distance will be run through country rock, and when the tunnel is completed it will strike the vein 500 feet below the present workings, and about 35 feet above the creek bed.

The Frisco is working twenty to thirty men, and running its mill about one day in the week. It is putting in the largest compressor in the Cœur d'Alenes, with a capacity of forty drills, and will use compressed air for the pumps, the hoist and the drills. The new hoist is on the road.

The Gem is working a full crew of 125 men, with double shifts in mine and mill, and is shipping about 1000 tons of concentrates monthly.

The Granite is being worked under lease, and has recently struck a new ore body which looks well. It is working the mill with one shift.

The Tiger is doing no development work. It is now working eighty men and shipping thirty tons of concentrates daily.

AT MULLAN.—Denis Ryan, of St. Paul, was recently at Mullan and left orders with the superintendent of the Gold Hunter to resume operations as soon as he can get a force of men at the Wardner scale of wages. Men are now coming in and making application for work. With the Hunter working on the basis of $3 and $2.50, it is believed that it will be only a short time till the Morning will resume, and this would give employment to about 300 additional men. The Hunter expects to employ about 100.

The Custer, on Nine Mile, which has lain dormant for the past three years, recently put a small force of men at work, and is being operated under the direction of Campbell & Finch.

OWYHEE COUNTY.

The Poorman was once a great gold producer, but since the time of the paralysis of the district, it had until recently been an uncertain quantity. When Mr. Grotho was put in charge for the London company, systematic development began. The mine already showed sufficiently to warrant the re-building of the mill, which was burned down last year, but it was proposed to put in only five stamps for the present. Developments were such, however, that it was later determined to put in ten stamps. The company is contemplating putting in twenty stamps at once. This is because a new strike has been made in the mine, which seems to justify such an enlargement of the plan of operations, as it shows a large body of good ore, and proves to the satisfaction of the management that the vein is strong and permanent.

BRITISH COLUMBIA.

ON THE ATHABASCA.—There are over 500 men mining on the bars at the mouth of the Pembina river, a branch of Athabasca river, making from $2 to $4 per day each. As soon as the water gets low enough they will move to old Fort Assiniboine on the Athabasca, where much richer diggings are known to exist.

THE SMELTING BOUNTY ACT.—The following is the smelting bounty act as passed at the late session of the Canadian Parliament at Ottawa:

1. To encourage silver-lead smelting and the smelting of other ores of silver and gold in Canada the governor in council may, subject to the following provisions, authorize the payment of a bounty not exceeding fifty cents per ton, and not exceeding in all one hundred and fifty thousand dollars, on Canadian silver-lead ore and other ores of silver and gold smelted in Canada between the first day of July, one thousand eight hundred and ninety-five, and the first day of July, one thousand nine hundred.

2. The said bounty shall not for any one year exceed the sum of thirty thousand dollars: Provided, that the said sum is unexpended, or any balance thereof unexpended may be carried forward from year to year and may be paid for any year in addition to the sum of thirty thousand dollars authorized as above for such year.

3. If in any year the quantity of ore smelted is greater than will allow of the payment, out of the sum available for that year, of fifty cents per ton, then the bounty for that year shall be reduced proportionately.

4. The said bounty shall not be paid on any ores smelted in smelting works which are not established and in operation before the first day of January, one thousand eight hundred and ninety-seven.

5. The payment of the said bounty shall be under the direction of the minister of trade and commerce, subject to such regulations as are made by the governor in council.

6. The governor in council may make regulations in relation to the said bounty in order to prevent fraud and to insure the good effect of this act.

7. The said regulations shall be laid before parliament within the first fifteen days of each session, with a statement of the money expended in payment of the said bounty, and of the persons to whom they were paid, and of the places where the ore with respect to which they were paid was smelted, and such other particulars as tend to show the effect of the said bounty.

ALASKA.

GENERAL NOTES.—Willis Thorpe purchased the Takou Consolidated group of mines for $75,000 at sheriff's sale. This group is considered among the best annual producers of Silver Bow basin.

Ex-Governor Swineford has commenced work upon the Lucky Chance and the Turner property is soon to be developed. There are indications of nickle in the Millmore vein.

In the neighborhood of Loring, placer diggings have been found on the Stewart river.

MONTANA.

THE JAY GOULD BONDED.—The Jay Gould mine, which has produced in three years $1,400,000, has been leased with a bond to purchase to G. B. Hoit and B. Geraldine of Chicago. The mine was examined and recommended by A. D. Churchill. It is expected that when opened and worked on the extended plan proposed the mine will largely add to the gold output of the State.

UTAH.

ANOTHER MERCUR DIVIDEND.—*Tribune*: The Board of Directors of the Mercur Gold Mining and Milling Company have declared another dividend of $25,000, or 12½ cents a share, payable Aug. 20th. This is the twelfth dividend that will have been distributed by that great gold producer, with a total of $300,000.

THE HORN SILVER.—Horn Silver has increased its payroll to 200 miners, and on the 20th will distribute about $20,000 among them. The mine that sold for $5,000,000 has paid dividends to date in the sum of $5,147,500.

COLORADO.

MISSED A GOOD OPPORTUNITY.—The Home Run property at Cripple Creek, for which there is now a standing offer of $100,000, was offered for sale for sixty days following last 25th of December for $1100. An option upon the property at that price was given to Guyot, Mullen, Griffith and Brainard, who were looking for a cheap patented claim in the Cripple Creek district to put in a mining company which was being incorporated by Eastern incorporators, who refused to pay the $1100.

TELLURIDE MINE SOLD.—The Japan mine, of the Telluride district, is sold for $125,000 to David Swickhimer and A. J. Clarke. The property embraces four claims, and has been operated at a profit for fifteen or twenty years. It is estimated that there is now blocked out in the mine $170,000 to $180,000 not profit. The mine has been paying $3000 a month during the development, and it is estimated at the present price of silver that it can be made to pay a profit of $6000 to $10,000 a month by the addition of a mill to concentrate large bodies of low-grade ore that have accumulated on the dump.

NEW MEXICO.

REPORTED A FAILURE.—The mill recently built at Bland, to treat Cochiti ores, is reported to be a failure. Cochiti ores are silicious, arsenical pyrites carrying a trace of tellurium; and about sixty per cent. silver and forty per cent gold. By raw pan amalgamation about sixty per cent of the value can be saved. Roasting and pan amalgamation will save ninety per cent. The shipping ore, which averages over 100 per ton, will average about ninty per cent silica.

ARIZONA.

PROSPERITY AT BISBEE.—At the Bisbee mine the daily product is $6,000. They ship 700 tons of copper bullion per month; they have 100 men working in the reduction works and 300 or more in the mine; they are running four large smelters and are arranging to put on more men and have in course of construction a smoke concentrator 12,000 feet long, and eight feet in diameter. This will carry to an elevation above the town the smoke and sulphurous fumes.

OLD PRODUCERS AND NEW DISCOVERIES.—*Journal-Miner:* The Mescal Milling Company has completed a run of 130 tons of ore from the Jersey Lily mine, and the Senator mill has run 100 tons from the same mine. The ore is expected to give a return of from $25 to $35 in bullion, while about a carload of concentrates has been obtained from the two lots. The concentrates are worth $90 per ton.

Holtzschue, Clark and Coy have sold the Planet and Saturn mines in Fool's gulch to Boston capitalists. These claims are located three miles from Congress station, and a mile from the Yarnell mine. They have about 350 feet of development work done on them and rich ore has been taken from them. The purchase price is said to be $60,000.

General Churchill, who recently returned from a tour through the mining regions, says: "About eighty miles south of Prescott there is a vast and rich mining region covered by hundreds of claims whose locations date back from one to thirty years. There has been almost no development, the locators having labored under the misapprehension that the claims could be sold as mines. This had formerly been done, but late purchasers have been unwilling to risk investments upon such surface indications. In many instances the locators were unable to go on with the development, and so during all these years they have been performing annually the $100 worth of work required by law. No attempt was made to procure the co-operation of capitalists and this rich district has therefore been permitted to lie practically idle. Now miners are taking a different view of the case and good prospects are being developed so that their real worth may be set before prospective purchasers."

T. P. Carson, superintendent of the Reymert group of mines in Pinal county, has for four months been working the Mountain Chief mine in Humbug District, on a six months' bond, and will commence the erection of a twenty-stamp mill for the reduction of its ores, settling the question of the purchase of the property. He has bought for his company the Farley & Kay group of twenty-seven claims near the Mountain Chief. A large force is at once to be put to work on the different claims to see what lies below the grass roots and much activity is promised for the district, which lies just north of the Yavapai county line, sixty miles south of Prescott, and not far from the Castle creek hot springs. The Farley & Kay group, on the authority of J. W. Yocum, is the best aggregation of undeveloped claims in the county of Yavapai, lying immediately within a cluster of fully a hundred well-mineralized claims. Upon the group are many ledges of highly mineralized ore, running high in sulphuretic gold and silver, though little underground work has been done upon them. Mr. Yocum is managing the affairs of the Columbia Mining Company in the district. His company, composed mainly of Kansas City capitalists, is furnishing funds for the development of several promising claims, exploration running 200 feet in depth. The ore is both free milling and concentrating.

TWO RUNS OF ORE.—*Journal-Miner:* The Mescal Milling Company has completed a run of 130 tons of ore from the Jersey Lily mine, and the Senator mill has run 100 tons from the same mine. The ore is expected to give a return of from $25 to $35 in bullion, while about a carload of concentrates has been obtained from the two lots. The concentrates are worth $90 per ton.

MEXICO.

A MINING CASE DECIDED.—An interesting mining case has just been decided at Nonclovia. Creditors of the Punuca Mining Company, living in New York, brought suit for possession of the property to cover a debt of $50,000 due them by the company. After a trial the Court rendered a decision in favor of the creditors, and they have been placed in possession of the mine, which is valued at $300,000.

A BONANZA.—The mine of the Mezquital Mining Company, south of Tepic, is in bonanza. The vein of gold in this mine is producing ore to the value of $25,000 per day.

Coast Industrial Notes.

—Oakland talks of subscribing the required bonus to secure the establishment there of the Ostrauder gun works.

—The California Prospecting and Development Co. has organized to bring the Beal Prospecting Coal drill into general use in sampling mining claims.

—Destructive forest fires have raged in western Washington since the 1st inst. Five saw mills near Tacoma were burned this week, and hundreds of thousands of acres of valuable timber land burned over.

—Henry T. Scott, president, has selected George E. Dow and L. R. Mead to act with him in arranging the details for the incorporation of the Manufacturers' and Producers' Association which now has about 1100 members.

—The hop growers on the American river have organized for mutual profit and protection. The price of hops is so low that it will hardly pay this season to gather them, and some growers have decided to let the hops rot in their yards.

—The Producers' and Consumers' Oil Company has organized at Fresno, Cal., to develop the petroleum district in the Coast Range mountains near Coalinga. The stock is subscribed by Fresno and Ohio men. The capitalization is $1,000,000, of which $100,000 has been subscribed.

—Luscious fruit and melons pitched into the bay here, for want of purchasers, while selling through the city at good prices, indicates to the producer the need of a better system of local distribution. At present the producer and consumer are "cinched" to swell the profits of the middleman.

—The Clear Lake Electric Company has a project to convert the waste water power of Clear Lake, in Lake county, and Cache creek into electrical power, to be used at points between there and this city, inclusive. Clear Lake is 1317 feet above the sea, and the water power to be derived from that source is considerable.

—Among the passengers on the steamer China last Tuesday was Irving M. Scott, of the Union Iron Works, who is of the opinion that San Francisco can and ought to build the new battle ships that Japan talks of getting. He took a model of the Olympia with him, and shortly after he gets to the island kingdom the Olympia herself will be there.

—Crude petroleum is to be used for fuel in the locomotives on the local Oakland and Alemeda trains. The oil costs twenty-five cents per barrel in Los Angeles, and the S. P. people figure they can lay it down on the bay at fifty cents per barrel. It is estimated that, as compared with coal at $4.50 per ton, a saving of twenty-five per cent can be effected.

—Fresno raisin growers and commission packers are advertising to buy raisins for cash and are offering two cents a pound in the sweat box. The commission dealers have difficulty getting contracts from the growers this year, and with some of them it has become necessary to offer cash or go without raisins to make their pack. The price offered is about cost of production.

—The damage done by the fire on the Austin tract near South Bay, Wash., is estimated at 5,000,000 feet of cedar and 30,000,000 of fir. For three-quarters of a mile from the lake the forest is perfectly clear of underbrush and all debris. It is thought that 150,000,000 feet of fir has been so burned as to necessitate logging within two years. At present prices this would amount to a forced marketing of timber worth on Bellingham bay $150,000.

—President J. B. Stetson and General Freight Agent W. L. Russell, of the North Pacific Coast Railroad Company, ask the State Board of Equalization that their company's assessment be reduced from $650,000 to $600,000, the same as it was last year. They complain that the business of the road has fallen off because the dairy and lumber business had dropped all along the line. The matter was taken under advisement.

—The Canadian Pacific is planning to build to Trail creek mining district—not a branch line or a "stub" road, but a direct branch from Revelstoke, giving all rail connection not only with Trail district but with the Slocan and Nelson mines. Fifteen Canadian Pacific surveyors, headed by competent engineers and fully equipped with all desirable instruments for rapid work, are now engaged near the foot of Lake Slocan in making observations and measurements and selecting a practical railway route.

—The superintendent of the Union Pacific motive department says: "Out of a total equipment on the Union Pacific system of 25,000 freight cars, 10,000 are equipped with air. All of the locomotives are equipped with air brakes and about 400 are supplied with the driver brake. As fast as the engines go through the shops at the present time they are being supplied with the driver brake, and by January 1, 1898, all the Union Pacific engines will be supplied with the driver brake according to law."

—Eastern men are at work on the old project to reclaim the Colorado desert by turning the waters of the Colorado river over that vast territory. As outlined, the plan comprehends the development of the greatest irrigation system in the western hemisphere. As an indication of the good faith of the promoters, they are said to have handed the Southern Pacific Company a check for $1,500,000 in return for its title to the alternate sections of land in the Salton basin, amounting to about 600,000 acres. The irrigation of so vast a tract of land would revolutionize the fruit industry of the country. The company say they expect to have 300,000 farmers on their lands within a few years.

Scientific Progress.

Records an Earthquake.

It is now possible to discover an earthquake and to mark its force at a distance of several thousand miles. A recent earthquake in Algeria was made known to scientists in Paris while it was actually taking place by the undulations of certain delicate instruments over a strip of paper. That the movements of the earth could thus transmit themselves almost instantaneously, registering, as it were, across the Mediterranean and nearly the whole of France more quickly than a telegraph message could have been sent, seems hardly plausible. But there is a subsequent more marvelous demonstration of the self-registering of an earthquake much farther away. Within an hour from the time it commenced the late earthquake in Japan had revealed itself to the instruments of the Roman college. The oscillations of the earth outlined themselves on a single sheet of paper clearly and distinctly, showing plainly that there were five separate "disturbances" of varying force. Recent scientific reports that have just come from the Japanese empire confirm the accuracy of the instruments of the Roman college in a most remarkable manner. The practical part of the discovery is that the approach of an earthquake may be told with little chance of error, though it must be confessed that the instruments give no hint of direction, nor do they indicate the starting point.

Instruments of this character were at Nicolaieff and Charkow, cities in the central part of Russia, and here the Japanese earthquake mentioned was registered even more plainly, the distance in this case being fully 4500 miles. The instruments in these towns were carefully watched at this time, and they were seen to oscillate and mark the tremblings of the earth for over an hour.

One of the most remarkable of modern inventions, indeed, is this seismograph, which was invented by Bertell. The most valuable evidence of its practical benefit to mankind was in 1883, when the sensitive machine gave warnings of an eruption of Mount Etna. Up to this time, however, it has only been valuable for foretelling shocks comparatively near at hand. The long-distance instances recorded above are the first in the history of the seismograph.

THE necessity for a patent court, whereby litigation arising out of the grant of patents may be speedily and inexpensively settled, is becoming more and more obvious every day. The subject of a patent court is not a new one, as it has been agitated for a number of years, and many bills have been introduced in Congress to establish the same, but have failed of success. The present courts having jurisdiction to try patent causes are overcrowded with other work, so that parties in litigation are subjected to vexatious and annoying delays, as well as to unnecessary pecuniary expense. The patent court should be composed of eminent patent lawyers and should have no jurisdiction over other questions. The members should also be allowed sufficient pay to induce competent persons to accept the positions. It should also be a court of last resort, thus avoiding the great delays incident to appeals. This court should also have jurisdiction of interference causes in the Patent Office, which would relieve the latter of a great deal of its work. It is to be hoped that the coming Congress will see fit to pass one of the many bills heretofore introduced relating to the subject.

AS THE RESULT of nearly 40,000 tests of timber made at the laboratory of the Washington University, St. Louis, the following facts have been determined: Seasoned timber is about twice as strong as green timber, but well-seasoned timber loses its strength with the absorption of moisture; knots are as great a source of weakness in a column as in a beam; long-leafed pine is stronger than the average oak, and bleeding timber does not impair its qualities.

GESNER'S method of protecting iron and steel against rust consists in forming on the surface of the metal a double carbide of hydrogen and iron, which is extremely hard and adherent. In fact, a bar thus coated can be bent through an angle of 45° without disturbing the layer. In carrying out the process the articles are thoroughly cleaned from rust, but it is not indispensable to remove all oil or grease. A couple of gas retorts are placed alongside each other and raised to a temperature of from 600° to 700° C. The articles to be treated are then placed in these retorts for about twenty minutes, after which a current of hydrogen is passed through the retorts for forty-five minutes. A small quantity of naphtha is then introduced, the supply being maintained for ten minutes. It is then stopped, the current of hydrogen being kept up fifteen minutes longer, when it is stopped and the retorts allowed to cool to 400° C., and when this temperature is reached the doors can be opened and the finished product removed. The coating thus given has a bluish color.

M. MOISSAN has recently succeeded in preparing large masses of pure molybdenum. This metal thus obtained has a specific gravity of 9, and is only fused with difficulty. The pure metal is quite as soft and as malleable as wrought iron, and can be easily forged at a red heat. It can be preserved without oxidation under water for several days. The most remarkable property of the metal is, however, the fact that it can be cemented like wrought iron, forming a "steel," if the term may be used, which can be tempered similarly to iron steel. Moreover, cast molybdenum containing several per cent of carbon can be softened by placing it in a mass of oxide of the metal, just as in the ordinary process of making malleable castings. Having a very great affinity for oxygen, M. Moissan suggests that it may be usefully added to the iron in a converter, replacing manganese or aluminum. As the oxide of the metal is volatile, it does not remain in the converter.

BARON NORDENSKJOLD has shown practically that water can be found by boring into granite and other crystalline rocks to a depth of from 100 to 170 feet. His theory was that the variations in temperature ought to cause shearing strains between the upper and lower layers of the rock, which would make horizontal crevices into which water from the surface would percolate, and that the water would be fresh. A well was sunk in the islet of Arko, off the Swedish coast, in 1894, and at 110 feet fresh water was found, supplying 4400 gallons a day. Since then six other wells have been bored and water found at about the same depth. The object of the search was to provide lighthouses and pilot stations with a permanent and plentiful supply of water.

CELLULOSE, a porous preparation prepared from cocoanut fiber, has been found exceedingly useful in stopping leaks in ships. A plug of it is thrust loosely into a large hole and soon swells with moisture until it fits snugly The idea originated abroad, but an American has discovered that cellulose can be made out of the pith of cornstalks. The naval authorities have tested this latter variety of the product and find it efficacious.

IT is asserted that smoke never does issue from a volcano. Nor does fire. The red light seen above the crater is not flame. It is the glow of molten lava reflected on the under side of the clouds of dust. And the clouds of dust are never mixed with smoke. There are bursts of steam sometimes, but rocks do not burn as wood does and give off the finely divided carbon dust that we know as smoke.

Mechanical Progress.

Electric vs. Hydraulic Elevators.

The economical operation of an electric elevator plant, as compared with a hydraulic elevator outfit, becomes principally a question of the efficiency of the generating plant. Ordinarily the efficiency of a drum-winding electric elevator, from the electrical energy at the motor terminals to the work done by the lifting cables, is from fifty to sixty per cent.

The efficiency is about the same as that of the hydraulic machine. As the steam-generating apparatus in both cases may be the same, it becomes a question between using steam in a pump cylinder to produce hydraulic energy at the other end, or using it in a modern high-class engine cylinder to produce electrical energy at the dynamo terminals. Generally considered, it would seem that the latter had the advantage, but the writer has been informed by a prominent hydraulic engineer that a hydraulic installation of the best design can equal an electric plant.

Even though this be a fact, and both installations have the same efficiency, from the coal consumed to the work done by the elevator car, the collateral advantages alone of the electric outfit would warrant its installation. In assuming, however, that the two are equally efficient, we are considering that both work with loaded cars. Whether loaded or empty, it matters very little in the hydraulic machine, as the cylinder always takes the same amount of water, although in some machines the cylinder is arranged to use either all or one-half of the full amount. The actual average efficiency of the hydraulic machine would, therefore, compare very poorly with that of the electric plant, in which the motor consumes energy only in proportion to the work required. The hydraulic machine, it is true, takes water power only one way, yet this is always sufficient to meet maximum requirements.—Joseph Sachs, in Cassier's Magazine for August.

A New Telegraphic System.

In a telegraphic device, based on vision synchronism, the alphabet is reduced to eight characters, which are straight lines from which letters are formed. It is claimed that 200 words a minute can be sent, and that as much work can be done with one line under this system as with ten under the Morse. A message is first written on a typewriter connected electrically with a punching apparatus. Through the punching apparatus runs a strip of paper an inch wide. As the letters are struck on the typewriter a series of holes are punched in the paper, the holes running in straight lines across it. Each hole, or series of holes, represents a letter. For instance, I is represented by one hole, because it takes but one of the elementary characters to make it. B, which is made by six of the elementary characters, the largest number required for any one letter, is represented on the ribbon by six holes. When a letter is finished the strip is also finished, and the strip is then put into the transmitting apparatus and runs over a small metal roller, above which is a series of small metallic fingers which press upon the strip. As the different holes in the strip of paper pass under the fingers electrical connection is made with the roller and the characters represented by the holes are struck at the other end of the line.

A DISPUTE about the two new battleships authorized for the current year has just been settled by the Naval Board of Construction. Chief Engineer Melville contended that an allowance of 1200 tons weight for the machinery was necessary to give the ship 11,000-horse power and the required speed of sixteen nots an hour. The board compromised on 1100 tons, ensuring 10,500-horse power. Secretary Herbert will have to pass upon the recommendation of the board. He has already approved the view of the majority that the new gunboats should have double-decked or two-story turrets, armed by 13-inch and 8-inch guns.

A DEVICE for stopping an engine from various parts of a mill, or from the engine room, in case of running away, by means of electricity, is being used. The pressure of the electric button energizes a magnet, which detaches a releasing gear, and a weight instantly throws the governor balls to their highest position, and presumably prevents the engine from taking steam. Where this has been tried it has proved successful so far. Yet, so far as being a safety device is concerned, its only advantage over the common governor is in the ability to shut it from various parts of the mill. The device lifts the governor balls to their highest position, but whether or not this does the work of shutting down the engine will depend upon whether the valves are set properly with relation to the governor, and if they are the governor will prevent racing without the use of this device as well as with it. The misadjustment of the valve gear or the changing of the length of the governor rods will make this safety stop of non-effect, for though it raises the governor to its highest position the setting may not remain such that in such position no steam will be admitted to the cylinder of the engine. The object of an automatic stop motion, as the *Scientific Machinist* understands it, is to act as two safety valves would act, one to be a distinct check upon the other. Any device that depends upon the governor depends upon something that is extremely liable to get out of order, either through accident or neglect. If the practice was common to keep these governors so they would control the engine when in their highest position, no other safety device would be needed, so far as the governor is concerned. The trouble is that these governors are continually being misadjusted, and the engineer who will permit such a condition of affairs at all will do so with a safety attachment upon the engine just as quickly. Such a device, therefore, is not a check upon the governor, but merely an adjunct to it, depending for its success upon the action of the uncertain governor itself.

THE new navy rifle, the invention of J. P. Lee, of Connecticut, has been recommended by the Small Arms Board after many experiments. By many this gun is believed to be superior to the Krag-Jorgensen rifle now used in the army. The navy rifle is lighter, thus enabling the sailor to carry fifty more rounds of ammunition than the soldier, and gives a flatter trajectory. The rapidity of fire is very great, five aimed shots being fired in three seconds. The total weight, with straps, is 8½ pounds, which enables the sailor to carry 200 rounds of ammunition. The barrel is twenty-seven inches long, the trigger is at all times under control, and there is no danger of accidental fire, while the magazine clip is the lightest in use. The fire is very accurate at 2000 yards, while at 5000 the bullet would pierce two or three men in a row. It would penetrate the body of a man at a distance of 6000 yards. The barrel is made of nickel steel. The results of the tests have been so satisfactory that it is thought the National Guard in some States will adopt it.

THE wire nail, made of steel or iron, is pronounced a failure as a shingle nail. The life of the wire nail when used for shingling is said by experts to be not more than six or seven years, and the length of time ranges from that down to five, four and even less in sections where large amounts of soft coal are burned, or from other local causes. The results from the nail being used where there is exposure to the sea air are even more disastrous, and in many places along the coast the steel nail has given place to the nail of copper or the galvanized nail. Even the old cut nail will last much longer in such exposed positions than the wire nail of steel or iron.

Electrical Progress.

A New Electric Railway System.

A newly invented street railway system solves the electrical propulsion problem by doing away with the trolley. It is easily built, and there is said to be no limit to its power. It is particularly adapted to city uses and for elevated roads, and is the property of a Pittsburg company. Its chief novelty is the manner in which the current is picked up. The car motor, instead of being fed from a continuous overhead wire through a revolving trolley wheel, receives its current from three metallic slats which extend underneath the whole length of the car. Every twenty feet three metallic knobs come to the surface of the pavement, and are so placed that each of the slats makes contact with one of them. There is no current whatever in these knobs until they come in contact with the three long conductors beneath the car. This result is accomplished by an automatic switch. One of the knobs receives from a small storage battery in the car a current of sufficient strength to attract an electromagnet to its keeper and thus complete the circuit for the main current. After operating the motor the main current passes back to the power house through another slat and its corresponding knob. In order that there may be no break in the supply of electricity, the set of knobs are placed a less distance apart than the length of the car. Before contact with one set has been broken, contact with another set has been made. As soon as the slats have ceased to touch a set of knobs the attraction in the electric magnet stops, and the knobs become pieces of ordinary iron again. There is thus no danger for horses or vehicles, as nothing but electricity passing through a knob can revive its hidden force. As the system does not contemplate the use of an underground trolley, it can be adapted to street railway tracks without any necessity of rebuilding the road.

Edison's Minor Inventions.

It is not the electric lights nor the phonographs, nor any of the other things with which Mr. Edison's name is connected, that strikes the visitor as the greatest part of his work. It is the invention of the innumerable machines with which these things are made. The idea of the electric light would have been of no use in the world without machines for making lamps and the other parts. All of these machines had to be invented and made by the electricians, and there are thousands of them—some no bigger than a toy engine, some as large, nearly, as a house. Many of them are so delicate that they are operated with a belt no larger than a shoestring. One of them is used for polishing jewels for use in the phonographs. Without being touched by anybody it holds the tiny jewel in every possible position, shifting it, turning it, absolutely feeling it, to learn whether it is smooth, and all the while its delicate fingers are at work rubbing, rubbing at the jewel, which is no bigger than the head of a large pin. No boy could move his fingers more dextrously than this machine moves its parts in turning the jewel around.

A Pittsburg dispatch reports that one of the lost arts has again been discovered, and three employes of the Carnegie Company, iron and steel workers, have discovered the art of welding copper to iron or steel. They show several samples of the metal perfectly welded. The last record history gives of these metals having been welded was in 500 B. C. The value of the discovery comes in the fact that copper offers greater resistance to the action of salt water than any other metal. The Carnegie Company has offered the men a fixed price for the secret. A shop has been fitted up for the men at the Homestead plant, where the men propose to weld a plate of copper to an ingot of nickel-steel armor plate. The Carnegie Company hopes to be able to cover all armor plates for big battle ships.

Three years ago there was a great deal of talk of an electric road between Chicago and St. Louis, making the 250 miles in two hours and a half or less. Practical railroad men at the time placed little confidence in the scheme, claiming that its projectors were trying to attain the perfection of electrical railroading at one bound and without the necessary intermediate experiments. Time has shown their judgment to be true. Railroad men agree that the use of electricity will not become general on the trunk lines until an absolutely certain system of underground contact has been worked out. The overhead wires they claim will never do for the great roads. It is possible in even temperatures like California, but no conduit has yet been designed which will withstand the adverse conditions of climate in the Eastern States.

The elimination of the element of danger of life and limb in the running of trolley cars has, it appears, engaged the attention of the electric railroad companies across the water more than it has in this country, where human life appears to be held so cheap. The report of the principal electric tramway company of Berlin, Germany, shows that in 1893 there was only one personal accident on its lines per 41,625 car miles run. The comparative safety of the German trolley lines, however, is not confined to Berlin. Other cities make an equally satisfactory showing, and in Halle there was in 1893 only one person injured upon a running of 88,640 car miles. Much of the credit of these figures, it is claimed, belongs to the excellence of the controlling devices with which the motor cars are equipped.

An electrical plant for the manufacture of phosphorus has been established at Grand Crossing, Chicago. It is now a modest affair, but it is the result of a number of years of experimenting, and the promoters say the method of manufacture they have discovered is so cheap they will be able to control the phosphorus market. At present there are but three active phosphorus plants in the world, one in the United States and two in Europe. The Chicago company will make the fourth. The annual output of phosphorus is estimated at 50,000,000 pounds. At an average wholesale price of 50 cents per pound, the value of the product will reach $25,000,000.

According to Charles Booth, in his latest work on the "Life and Labor of the People of London," the great majority of men employed in all branches of electrical work in London are under 25 years of age. It is also stated that of some 5000 men engaged in different electric works, only 13 per cent are members of a trade union. It has often been noted in this country that nearly all practical electricians are young men.

Calecoli's type-setting machine, actuated by electricity, is described by *L'Illustration*, of Paris, as likely to work a revolution in printing. Its capacity, when manipulated by an experienced operator, is said to be 50,000 ems an hour, which is several times the speed of any present machine.

The Mutual Electric Light Co. will soon have its plant in operation and will enter into immediate competition with the Edison Light and Power Co. Indications are lower prices and, after awhile, a "business understanding," and an adjustment mutually satisfactory.

The Southern Pacific Co. has about determined to equip all of its passenger trains with electric headlights.

Practical Information.

Russia's Mineral Development.

Consul Morris furnishes advance sheets of a consular report from which it is learned that the production of pig iron in 1881 amounted to 492,950 tons, and in 1893 to 1,278,350 tons. This industry has especially developed in southern Russia, where the works, situated near the rich mineral deposits of Krivorog, are abundantly supplied with combustible material. The manufacture of iron has increased from 323,200 tons in 1880 to 543,500 tons in 1893. In the same period the production of steel has increased from 338,650 tons to 538,050 tons. The quantity of rails produced has only slightly increased, in all only 28,900 tons, but this essential difference is to be noted, viz.: Of the 220,300 tons manufactured in 1880, 184,650 tons were made from imported pig iron, the remainder being produced by Russian establishments from Russian raw material. The production of manganese was commenced in Russia only two years before the commencement of the last reign. In 1880 the total quantity extracted amounted to 10,850 tons; in 1893 it reached 274,450 tons. Owing to the employment of this mineral in the manufacture of steel, the demand for manganese has rapidly progressed, and the mineral of the Caucasus has opened for itself rich markets. The extraction of mercury had its beginning in Russia scarcely ten years ago, but at present the country is not only able to dispense with foreign mercury, but since 1889 considerable quantities have been exported. The production of coal, which was 3,627,450 tons in 1880, amounted to 8,309,350 tons in 1893. The salt produced in 1893 amounted to 1,598,950 tons, against 857,650 tons in 1880. The naphtha industry has had a colossal development. The construction of the necessary railroads and other appropriate measures have enabled the Russian supply not only to furnish that country with petroleum and grease, but also to organize a vast export trade to all parts of the world. In 1880 the amount of naphtha extracted was 386,400 tons; in 1893 it amounted to 6,084,850 tons. Coincident with the increasing production, the importation of naphtha and its products decreased from 21,667 tons in 1880 to 361 tons in 1893, while the exportations increased from 4460 tons to 1,070,721 tons.

Seasoned Lumber.

There is no difference between "seasoned" lumber and "dried" lumber. "Thoroughly seasoned" or "thoroughly dried" lumber is lumber which has been dried, either in the open air or in a dry kiln, until it has reached that state of dryness which is relatively permanent. It then contains water equal to about ten per cent of its weight. This is what might be called the atmospheric moisture. This will remain in the wood unless driven off by evaporation at a temperature of 212° Fahrenheit or more. The word "thoroughly", when used in this connection, means "uniformly" as well as "effectually." That is, "thoroughly dried" lumber is dried uniformly throughout its entire cross-section and throughout its entire length.

To determine the percentage of moisture of lumber it is only necessary to cut a section from a board or stick and weigh it; then dry in an ordinary stove oven with a slow fire for an hour or two and then weigh again; the difference in weight divided by the dry weight is the percentage of moisture. As determined by this test, "thoroughly dry lumber" should not contain more than ten or twelve per cent of water, and the interior should be as dry as the exterior.

The necessity for using thoroughly dried lumber where shrinkage is to be avoided, arises from the fact that below about thirty per cent moisture lumber shrinks nearly as much as it dries. That is to say, when lumber dries down from thirty per cent moisture to ten per cent moisture it dries out, or loses in weight, twenty per cent of its dry weight. It also loses about twenty per cent of its dry volume, or say fifteen per cent of its volume at thirty per cent moisture. The shrinkage lengthwise is very slight.

A consular report tells of large quantities of shelled eggs being sent to England from Russia and Italy for the use of pastry cooks, bakers, hotels and restaurants. The eggs are emptied from their shells into tin cans holding a thousand or more, and after being hermetically sealed are packed with straw into wooden cases, the taps through which the contents are drawn being added by those using them. Great care is necessary in selecting the eggs, as a single bad one would spoil the whole lot. Lower price and saving of time and greater ease and less expense and loss in handling are named as the advantages of this system. Thus far the Russian product has been uniformly good, whereas the Italian shipments have so frequently been spoiled that analysis of the Russian supply has been ordered to determine if preservatives are used.

Intelligible heliographic signals have been exchanged between Denver and Long's Peak, a distance of seventy miles. The signal corps went on to Pike's Peak, to try it from there. Long-distance signaling is no new thing to plainsmen. For ages the Indians have had a way of conveying intelligence by means of smoke. They make a fire of green boughs, cover it with a blanket, and by lifting the cover at proper intervals and letting out puffs of smoke, they convey information that is understood miles away. The aboriginal telegraph was somewhat on the principle of Morse's original system; the puffs might be long or short, and the column of smoke large or small, according to the urgency of the action advised by the distant correspondent.

It appears very strange sometimes how rapidly an upright boiler will be externally corroded along the grate line, and particularly when the engineer asserts that ashes are never allowed to accumulate. The average engineer, however, does not carefully clean out between the edges of the grate bars and the shell, however careful he may clean the grate. Some engineers have a practice of banking with wet coal that may assist in this corrosion, particularly if the coal is soft and has some sulphur in its composition. In very many ways the ashes may become damp when laying off over night or Sunday, and is held against the shell and soon eats its way through.

The final report of the executive committee of awards of the World's Columbian Exposition has just been published. The total number of medals awarded was 23,586, of which number foreign countries received 13,740, and the United States 9846. Foreign countries captured 14,366 diplomas, while the United States secured 10,622, making a total of 24,988 diplomas. Foreign honors went to Germany, the representatives of that country winning 2518 medals and 2649 diplomas. Japan was second with 1581 medals and 1598 diplomas.

High speed engines, as a class, are often condemned for irregularity of running and rapid wear when the fault is not in the type but in the attention given the machine itself. It stands to reason that a short-stroke engine, running at a high velocity, requires more oversight than one which makes the same piston speed with one-fourth the number of revolutions, but this fact is not always taken into account by owners, who think that an engine is an engine and that all of them will run economically under the same conditions.

There is a growing belief that the shallower parts of the eastern Atlantic are portions of a submerged continent that once joined the American mainland.

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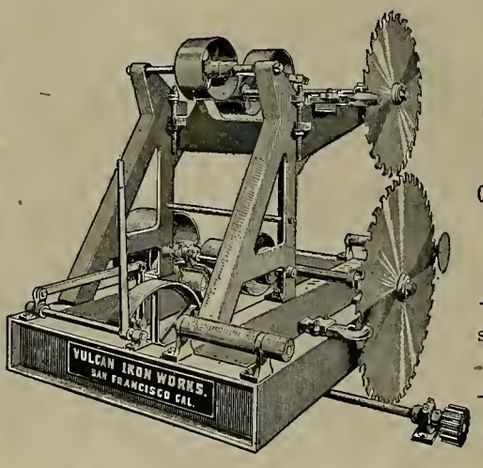
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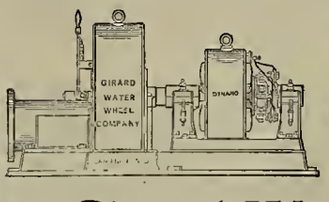
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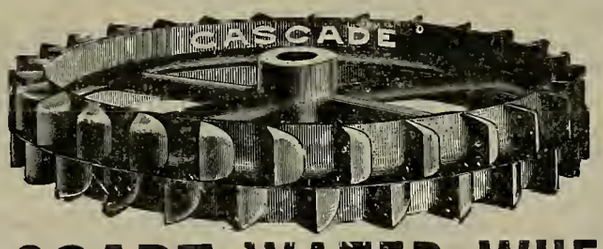
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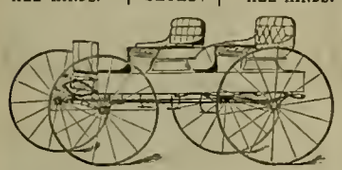
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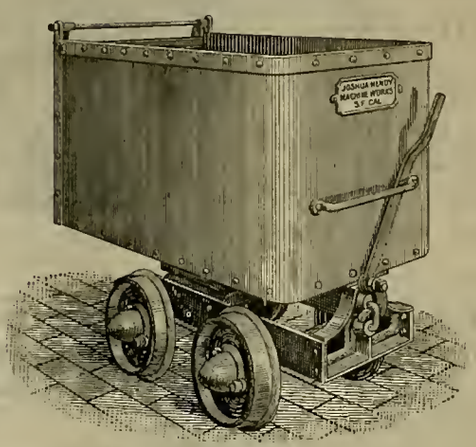
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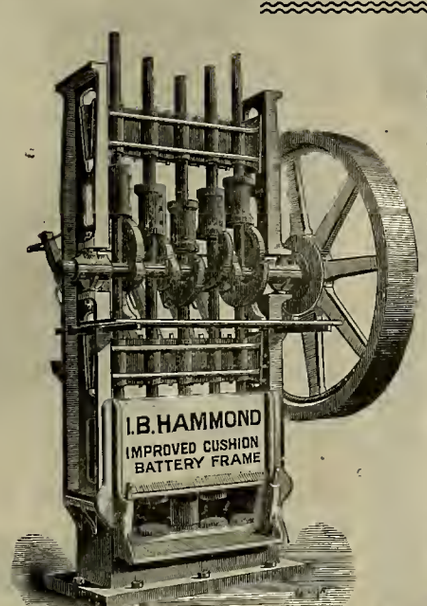


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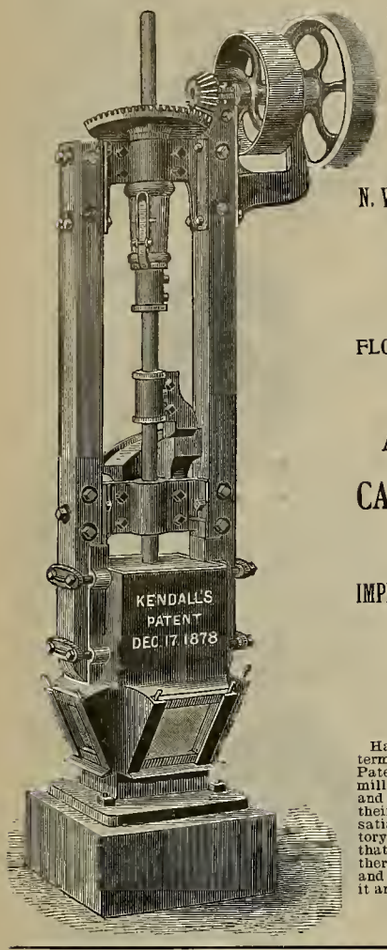
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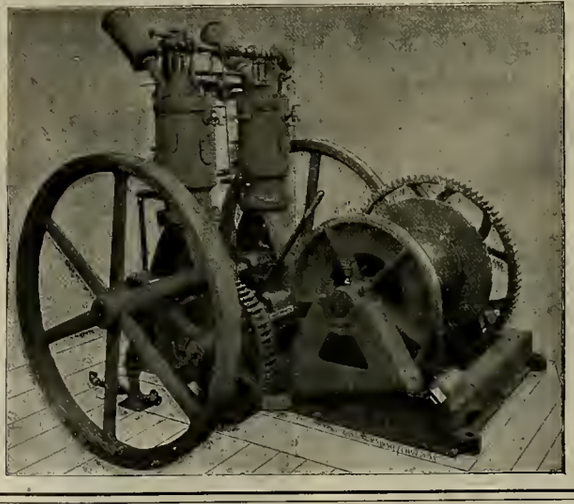
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Pittsburgh, Pa.	German National Bank Building.
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For information concerning this process for the reduction of ores containing precious metals, and terms of license, apply to

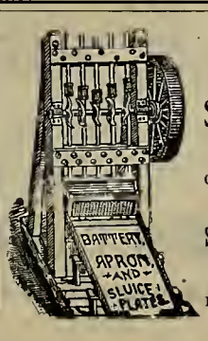
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Has been established under a thoroughly qualified instructor. The course is thoroughly practical. Send for Circular. C. S. HALEY, Sec.

Market Reports.

The Markets.

SAN FRANCISCO, Aug. 15, 1895.

Interest, except in the political world, is transferred from silver, which about holds its own, to copper, which has advanced 30 per cent in value in a comparatively short time.

Copper is the electrician's metal, and every electric railway and electric-lighting plant have to depend upon copper to supply them with the necessary facilities to carry on operations. These enterprises are multiplying so rapidly all over that it is safe to predict they will create a new and most significant demand for copper wire. Old systems are being extended, and new electric railways are being projected right and left. The demand for electric roads is spreading not only throughout this country, but in Europe also, and it has even extended to Rome, where application has been made to construct and operate an electric railway in that city.

London is to build a new underground electric railway to cost £3,000,000. Leading authorities engaged in the manufacture of copper wire state that feeder cables of pure copper are now made as heavy as 3⅜ pounds to the foot, or 19,800 pounds to the mile. These large cables are made of bare stranded copper of 49 and 61 strands each, and are used on account of their greater conductivity.

As an applied science electricity is advancing, and the revolution in motive power which it will create must prove of immense significance and benefit to the whole copper industry. The electrical demand in itself will yet electrify the copper market, otherwise it would have to be demagnetized to escape its influence.

A new York treasurer of a local copper mine says that thirteen or fourteen cent copper would not surprise him. He figures that the copper market is back to the position where it was when the Anaconda and Boston & Montana came into the field as producers and broke the market to the lowest prices ever seen, and created the enormous export business which has been witnessed the last few years; whereas formerly copper was three to five cents higher here than abroad. Now he finds that the consumption of copper has expanded until it is able to absorb the output of all the present producing mines in the country; in fact, he figures that our consumption is now for the first time in years ahead of our production.

The last Calumet & Hecla report gives the output of mineral equivalent in round figures to 80,000,000 pounds of refined copper; of which 60,000,000 pounds were smelted and the balance stored.

With this 20,000,000 stored and the same output this year as last the company will have for sale 100,000,000 pounds of refined copper. The cost is probably six cents or under. The profit on 100,000,000 pounds at the present price of copper would be $6,000,000, or $60 per share. Last year dividends of $15 per share were paid, and the lowest price of the stock was $250, at which price it netted six per cent.

Pig lead continues strong. There have been further advances of $9 per ton from the low point in March. White lead has advanced $5 per ton.

New York Metal Market.

NEW YORK, Aug. 15.—PIG IRON—Southern, 11@14c; Northern, 12@14c.

COPPER — Brokers', 11.80@11.88c; exchange, 12.20@12.25c.

LEAD—Brokers', $3.37½; exchange, $3.55.

TIN—Straits, 14.60@14.65c.

SPELTER—Domestic, $4.10.

New York Silver Prices.

NEW YORK, Aug. 15.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.
Friday	30⅝	66¼	11 70	.....
Saturday	30⅜	66⅛	11 75	3 37
Monday	30⅛	66¼	.....	3 37½
Tuesday	30⅜	66⅜	.....	.....
Wednesday	30⅛	66⅛	11 85	3 35
Thursday	30⅜	66¼	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum.....7@8
Commercial Loans, prime.....6@8
Call Loans, gilt edged.....7@8
Call Loans, mixed securities.....7@8
Mortgages, prime, taxes paid by lender.....6@8
New York Sight Draft.....2½c
New York Telegraphic Transfer.....5c
London Bankers' 60 days.....$4.80½
London Merchants.....$4.87½
London Sight Bankers.....$4.90¾
Refined Silver, per ounce.....66¾c
Mexican Dollars, nominal.....54c

San Francisco Metal Market.

COPPER.

Bolt.....¼ & 5-16, 17c; ⅜ and larger, 17c
Lake Superior Sheathing..... 19 @ —
Ingot, jobbing..... — @ 15
Ingot, wholesale..... 14 @ 13
Sheet copper..... — @ 18

ZINC.

Sheet..... 9 @

LEAD.

Pig..... — @ 4 00
Bar..... — @ 4 10
Sheet..... — @ 5 35
Pipe..... — @ 4 85

IRON.

American Soft.....15 00 @17 00
Pig, per ton.....16 00 @19 00

STEEL.

English, lh..... 15 @ 17

ANTIMONY.

Per lh..... — @ 10

COKE.

Gas Companies'..... 75c ₱ hhl
English, to load..... 9 00 @ 10 00
" spot, in hulk..... — — @ 13 00
" in sacks..... — — @ 15 00
Cumberland..... 9 00 @ — —

PIG TIN.

Per lh..... 15 @ 16 00

QUICKSILVER.

Home trade, per flask.....41 00 @ — —

TIN PLATE.

Per bx..... 5 25 @ 6 00

ZINC.

Sheet..... 8¼@

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Belcher S M Co., Nev	51	25c	July 16, Aug 20, Sept 10	C L Perkins, Mills Building
Bodie Con M Co, Cal	18	15c	Aug 13, Sep 16, Oct 7	M E Willis, 309 Montgomery
Con Imperial, Nev	36	1c	Aug 5, Sept 12, Oct 3	C L McCoy, Mills Building
Evening Star M Co, Cal	19	1c	Aug 5, Sept 10, Sept 22	J J Scoville, 320 Sansome
Gold Bar Cons M Co., Cal	1	2c	May 24, Jun 29, Aug 21	E C Godfrey, Crocker Building
Gould & Curry, Nev	76	15c	July 2, Aug 5, Aug 28	A K Durhrow, 309 Montgomery
Kentuck Con, Nev	11	10c	Aug 6, Sept 10, Oct 1	Aug Waterman, 309 Montgomery
Mono M Co, Cal	35	10c	July 16, Aug 15, Sept 10	M E Willis, 309 Montgomery
Occidental Con M Co, Nev	19	10c	June 25, July 30, Aug 21	A K Durbrow, 309 Montgomery
Ophir S M Co, Nev	66	25c	July 11, Aug 13, Sept 2	E B Holmes, 309 Montgomery
Potosi M Co, Nev	44	25c	July 14, Aug 14, Sept 4	C E Elliott, 309 Montgomery
Sierra Nevada S M Co, Nev	109	25c	July 30, Aug 30, Sept 23	E L Parker, 309 Montgomery

Mining Share Market.

SAN FRANCISCO, August 15, 1895.

There was an advance during the week that was maintained throughout; the week was a busy one for the brokers. Prominent controllers of Comstock mines are here in consultation, and not in many years has the street seen John W. Mackay, Senator J. P. Jones, Alvinza Hayward, and Superintendents Lyman, Kervin, Keating and Sharon in consultation. The first two mentioned say they are simply here "for a little rest." Mr. Mackay says he will remain two or three months and visit the Comstock while "resting" himself.

Hale & Norcross has improved in price since the decision and the mine prospects have also improved.

To encourage business the Pacific Stock Exchange has done away with its tickets of admission. A resolution has been introduced in the big board to allow outsiders to go on the floor during the informal session upon the payment of a small monthly fee.

The Con. Cal. & Va. directors will investigate the matter of Supt. Lyman's alleged stock manipulations this Saturday morning.

The following illustrates the changes of the week:

Mines.	Aug. 8	Aug. 15
Alpha	.....	.....
Alta Consolidated	.....	.....
Andes	$ 30	$ 31
Belcher	27	31
Best & Belcher	94	1 25
Bodie	.....	12
Bullion	20	21
Challenge	.....	.....
Chollar	58	62
Confidence	.....	.....
Consolidated California and Virginia	2 90	2 95
Consolidated New York	.....	.....
Crown Point	.....	43
Exchequer	.....	02
Gould & Curry	54	65
Hale & Norcross	2 00	1 90
Justice	.....	.....
Mexican	67	74
Ophir	1 30	1 70
Overman	16	.....
Potosi	34	65
Savage	41	41
Sierra Nevada	44	.....
Union	50	53
Utah	.....	.....
Yellow Jacket	36	41

San Francisco Stock Board Sales.

SAN FRANCISCO, August 16, 1895.

9:30 A. M. SESSION.

300 Andes	31	500 Exchequer	02
400 Best & Belcher	1 25	400 G. & C.	65
150 Bodie	12	300 H & N	1 90
100	11	200 Kentuck	02
100 Bullion	21	100 Mexican	74
500 Bulwer	05	300 Occidental	30
100 C. C. V.	2 90	250 Ophir	1 70
100	2 95	100 Savage	41
200 Caledonia	14	100 Union	52
100 Crown Point	42	50	53
100	43	200 Yellow Jacket	41

SECOND SESSION—2:30 P. M.

50 Ophir	1 65	50 Hale & Norcross	1 80
300 Gould & Curry	60	100 Belcher	31
20	61	300 Exchequer	02
400 Best & Belcher	1 15	100 Union	51
10	1 05	50 Caledonia	14
100 Con Cal & Va	2 90	200 Andes	29
50	2 85	100 S B & M	09
100 Savage	39	100 N. G. & C.	25
100 Chollar	62	50 Bodie	15
200 Potosi	65		

Assessment Notices.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 25th day of June, 1895, an assessment (No. 19) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of July, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on WEDNESDAY, the 21st day of August, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office, Room No. 69, Nevada Block, No. 309 Montgomery Street, San Francisco, California.

KENTUCK CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the sixth day of August, 1895, an assessment (No. 11) of Ten (10c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room No. 23, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the tenth day of September, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the first day of October, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

AUG WATERMAN, Secretary.

Office—Room No. 23, Nevada block, No. 309 Montgomery street, San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$700 00
M. J. McDonald, Trustee	295	1,000	100 00
M. J. McDonald, Trustee	296	1,000	100 00
M. J. McDonald, Trustee	298	1,000	100 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
Mrs. Hattie C. Baggs	529	201	20 10
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
S. H. Barnes, Trustee	289	500	50 00
S. H. Barnes, Trustee	353	154	15 40
Geo. Dillman	530	980	98 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
Israel Luce, Trustee	397	1,000	100 00
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Auderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	482	1,250	125 00
W. W. Sargeant, Trustee	485	1,000	100 00
W. W. Sargeant, Trustee	488	745	74 50
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	516	600	60 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
Jos. Rosenthal	489	5	50
Percy Beamish, Trustee	494	500	50 00
Percy Beamish, Trustee	495	225	22 50
H. H. Nohle, Trustee	523	4,000	400 00
Montgomery Baggs	528	100	10 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

GOLD BAR CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 24th day of May, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
John E. Todd	5	2,500	$ 50 00
John E. Todd	6	2,500	50 00
John E. Todd	9	2,500	50 00
John E. Todd	55	2,500	50 00
Jas. P. McCarthy	13	625	12 50
Jas. P. McCarthy	13	2,500	50 00
Jas. P. McCarthy	64	2,500	50 00
Jas. P. McCarthy	65	2,500	50 00
Jas. P. McCarthy	66	2,500	50 00
W. A. H. Connors	14	625	12 50
W. A. H. Connors	52	1,800	36 00
John H. Page, Trustee	22	500	10 00
John H. Page, Trustee	23	500	10 00
John H. Page, Trustee	84	9,000	180 00
C. A. Moore, Trustee	28	5	10 00
C. A. Moore, Trustee	29	4,965	99 30
C. A. Moore, Trustee	32	16,666	333 32
I. N. Pattison	53	1,000	20 00
J. S. Herron	41	300	6 00
E. C. Godfrey, Trustee	74	6,000	120 00
E. C. Godfrey, Trustee	57	1,000	20 00
E. C. Godfrey, Trustee	58	500	10 00
E. C. Godfrey, Trustee	59	500	10 00
E. C. Godfrey, Trustee	60	200	4 00
E. C. Godfrey, Trustee	85	2,500	50 00
E. C. Godfrey, Trustee	86	4,000	80 00
Louise V. Rugg	36	10,000	200 00
A. U. Kugg	33	16,667	333 34

And in accordance with law, and an order from the Board of Directors, made on the 24th day of May, 1895, so many shares of each parcel of such Stock as may be necessary will be sold at public auction at the office of the Company, Room 38, Crocker Building, corner Montgomery and Market streets, San Francisco, California, on Monday, the 22nd day of July, 1895, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

E. C. GODFREY, Secretary.

Office—38 Crocker Building, San Francisco, California.

POSTPONEMENT.

By a resolution of the Board of Directors of the Gold Bar Consolidated Mining Company the day of sale of the above delinquent stock has been postponed to WEDNESDAY, August the 21st, 1895, at the same place and at the hour of 2 P. M.

E. C. GODFREY, Secretary.

Office—Room 38 Crocker Building, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from W. A. and M. E. Schofield, in the King Sayre Mine, near Gibsonville, Sierra Co., to impound tailings in Whiskey Creek; from N. B. Willits and B Pride, in the Willow Placer Mine, near Sierra City, Sierra Co., to impound tailings on flat ground; from Oliver F. Caya and W. T. Sherman, in the Canada Mine, near Port Wine, Sierra Co., to impound tailings in French Ravine from H. and A. A. Moyer and John Costa, in the Argentine Mine, near Downieville, Sierra Co., to impound tailings in a dry ravine; and from John Pascoe, in the Eureka Bydraulic Mine, near Placerville, El Dorado Co., to impound tailings in Chili Ravine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Sept. 2d, 1895, at 1:30 P. M.

California Inventors Should consult DEWEY & CO. AMERICAN and FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent attorneys enables them to offer Pacific Coast Inventors far better service than they can obtain elsewhere. Send for free circulars of information. No. 220 Market St., San Francisco, Cal.

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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUGUST 6, 1895.

543,843.—TELEPHONE—J. S. Bigger, S. F.
543,850.—KEY FASTENER—John & Campbell, Seattle, Wash.
543,938.—FOLDING SCREEN—E. Coppleters, S. F.
544,218.—VOTING MACHINE—S. Ducas, S. F.
543,890.—PROPELLER—Flowers & Fox, Newport, Or.
544,173.—LUBRICATOR—Hogue & Smith, Portland, Or.
544,062.—BANDAGE—R. Jacks, Quincy, Cal.
544,063.—BOOTJACK—R. Jacks, Quincy, Cal.
544,091.—LUBRICATOR—J. Janda, Korbel, Cal.
543,963.—RHEOSTAT—C. Landers, Tacoma, Cal.
543,938.—CASTER—C. E. Larrabee, Berkeley, Cal.
544,060.—FLUME GATE—H. Pearson, Redlands, Cal.
544,070.—TRUNK STRAP LOOP—L. Phelan, S. F.
544,122.—LAWN SPRINKLER—N. L. Rigby, Los Angeles, Cal.
543,908.—DOOR LATCH—J. F. Stone, Oakland, Cal.
544,011.—SYRINGE—F. Terramorse, S. F.

NOTE. Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

TRACE CONNECTION FOR VEHICLE SHAFTS.—Jacob H. Wiscbeart of Sacramento, Cal., assignor to John Mason of Petaluma, Cal. No. 543,225. Dated July 23, 1895. The object of this invention is to avoid the necessity of a locking trace or tug. These parts of a harness are buckled at the forward ends to the hames or to the breast strap, and at their rear ends are connected with the singletree. The traces or tugs are thus very long, and, in unhitching a horse, care must be taken in disposing of these long parts to keep them out of the way. This disadvantage is obviated by this trace connection, which consists of a housing secured under the shaft and having a slot in its side, a slide within the housing having a lug projecting through and operating the slot thereof and adapted to receive the trace or tug, a spring seated within the housing and controlling the slide, a second spring on the other side of the slide to prevent rattling and a loop extending rearwardly from the housing with its free end secured to the shaft, said loop being adapted to receive the hold-back strap.

TIRES FOR VEHICLES.—A. J. Rudolph, Chicago, Ill. No. 543,704. Dated July 30, 1895. The object of this invention is to provide an elastic tire which may be used for vehicles of all descriptions in which the penetration produced by sharp obstructions upon the road will be reduced to a minimum and the flexibility and resiliency of the tire will be greatly increased, while reducing the trend to a minimum to save friction and expenditure of power. It consists of blocks or sections of elastic material elongated radially and attenuated transversely, threads of fabric forming a warp and weft therefor, woven through said blocks while in the elongated condition, the fabric being released after the threads are fastened, and interior air-proof surfaces or tubes allowing compressed air to be introduced therein.

BICYCLE BRAKES.—Jorgen Christensen, San Francisco, Cal. No. 543,723. Dated July 30, 1895. The object of this invention is to provide a brake which is easily applicable, and especially adapted for use upon the pneumatic tires or the rims of bicycles to produce a sufficient frictional and retarding effect without unnecessary wear of the substance of the tire. It consists of rollers revolvable upon diverging shafts, the meeting angles of which are connected with an arm or lever by which they are reciprocated so that the angle of the shafts to each other is increased or diminished by moving the meeting ends of the shafts in a line intermediate between the two, thus causing the rollers to press upon opposite sides of the tire, and turn with a frictional contact so as to interpose a resistance to the revolution of the wheel without a rubbing friction.

BICYCLE BRAKE.—Jorgen Christensen, San Francisco, Cal. No. 543,724. Dated July 30, 1895. This invention is of a similar nature to that previously described, and consists of rollers, shafts upon which they are loosely journaled upon opposite sides of the wheel, lever arms to which the upper and lower ends of the shaft are fixed, said arms being pivoted to and turnable about fixed supports so that the rollers may be made to approach to or separate from each other and press upon the wheel rim with greater or less force, as may be required.

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No Detention from Business.
QUICKLY! PERFECTLY! PERMANENTLY!

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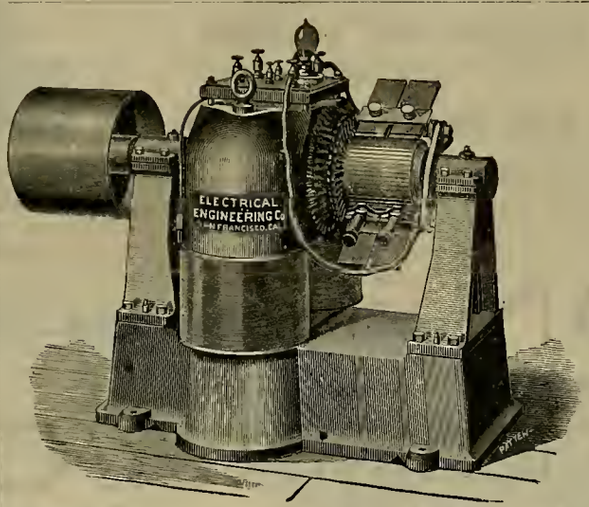
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Power, Mining, Milling, Smelting, Concentration and Leaching Machinery; Return Tubular and Water Tube Boilers, Corliss Engines, Jones' Mechanical Stokers, Hoisting Engines, Riedler Air and Gas Compressors, Riedler Pumping and Blowing Engines, Cornish Pumps, Roots Blowers, Copper Converters, Pyritic Smelters, Horseshoe Roasting Furnaces, Comet Crushers, Crushing Rolls, Stamp Mills, Shoes, Dies, Perforated Metals, Sectional Machinery, Huntington Mills, Frue Vanners, Bridgman Samplers, Concrete Mixers, Heavy Machinery and Mine Supplies. - - Write for Catalogues

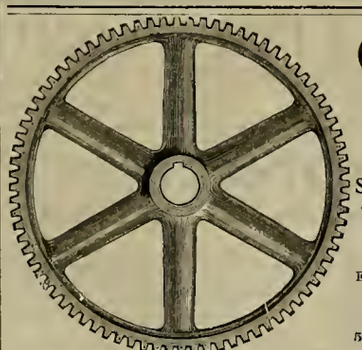
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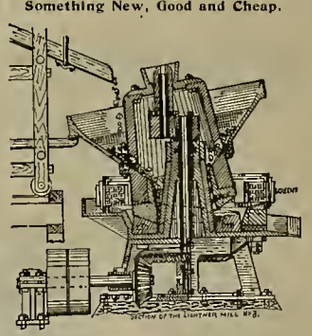
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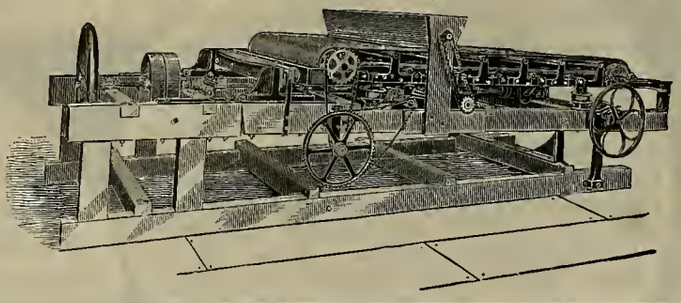
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SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.
CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

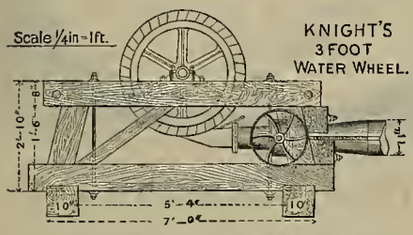
PRICE.....$350 EACH
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Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94¼ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.
You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works.

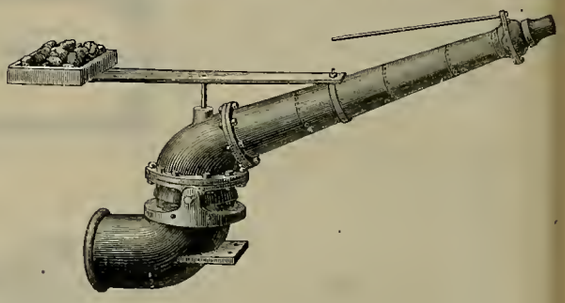
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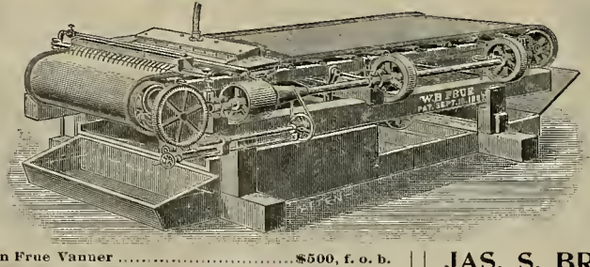
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Manufactured under Patents of
April 27, 1880;
September 18, 1883;
July 24, 1888;
March 31, 1891.
July 18, 1893.



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MINING AND SCIENTIFIC PRESS.
AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 8. SAN FRANCISCO, SATURDAY, AUGUST 24, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

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Sampling Gold Quartz.

Articles in the MINING AND SCIENTIFIC PRESS of July 27th, August 3rd and August 17th, respectively, have furnished practical figures for practical assayers. It is believed that the information in those three articles thus appeared for the first time. With less claim to originality, but to complete the matter and present it in such shape as to be of the greatest practical value to the prospector, is herewith given a working test for determining the quantity of gold mechanically combined with auriferous vein matter.

The gold quartz from which the working test is to be made should be taken from the lode at the ends or face of the drifts, backs or croppings by an experienced, practical miner, in a quantity of not less than thirteen cubic feet, and a true average of the rock in sight. This broken thirteen cubic feet should be broken to the size of macadam stuff, of which, after a thorough mixing, two hundred weight, representing as nearly as possible an average of the whole, is to be placed on a piece of canvas about six feet square, in the center of which is a stamp die, and with hammers reduced small enough to pass through a two-inch riddle, the die then removed, and the canvas raised from each side, so that the broken quartz be well mixed, from which two samples of four pounds each can be taken. The four pounds samples should be passed through a hand rock crusher till fine enough to go through a sieve with thirty holes to the linear inch, or finer if desired.

An improved batea, as made by Justinian Caire of this city, will give good results.

When the miner is desirous of making a very accurate working test, two bateas should be used, so that the tailings from the first operation can be washed over again. The right hand fingers should also be covered with rubber cots, so that the grease from them may not float the gold; a little washing ammonia should also be added from time to time during the washing or panning out. In case there is any talcose or greasy matter in the samples of veinstone, it should be soaked in boiling water with a little caustic soda for ten or fifteen minutes before panning out.

When the gold and pyritic matter are brought together in the center of the batea, and well freed from the gangue, allow them to be covered with water, and with a bar magnet remove all magnetic iron, care taken at the same time that none of the gold is picked up with the iron.

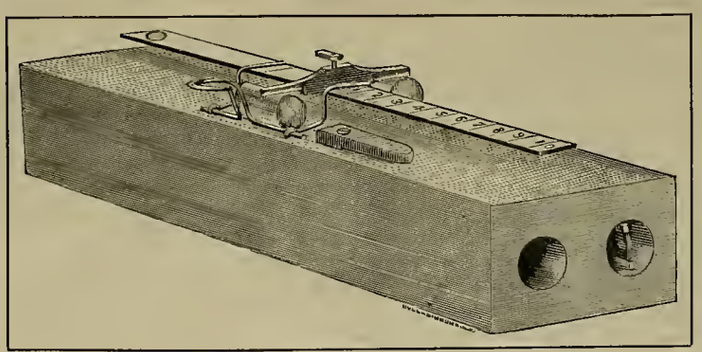
When all the gold is well collected in the center of the batea, a little pure mercury is added sufficient to form a hard amalgam. This mercury, being rubbed by the finger covered by a cot, will rapidly take up the gold, the wooden surface of the batea greatly assisting the operation. The pyritic matter left, if thought to contain any gold, can be ground up fine with water and mercury in an agate mortar or roasted in a clay dish with a little nitrate of soda and then amalgamated. The four-pound samples are to be treated as directed, the resulting amalgam put in a piece of charcoal, and the mercury volatilized by the aid of a blowpipe; the resulting gold being weighed, the value per ton of rock will be found by the accompanying tables.

The balance and frame, as shown by the accompanying drawing, is made by John Taylor & Co., this city, is about seven inches long and one and a half wide and one inch deep. The balance is a German silver beam, six inches long and one-fourth of an inch wide; the fulcrum knife-edged and the bearings pieces of round glass.

On the right hand side of the fulcrum ten divisions are marked at equal distances from each other, and on the left hand side a small depression is made to receive the globules of metal or a small pan for gold dust. Above the fulcrum is a small vane, which, being turned to the right or left, adjusts the beam to equilibrium. The two small wires resting upon the beam keep it in place, while the globules to be weighed are being placed on the beam. By a very slight pressure with the finger the wires are raised and allow the beam to work.

The number of weights required are three, made of flattened wire, viz., ten grains, one grain and one-tenth of a grain. The weights are moved from one division to another, as required to balance the globules, keeping the flat side on the lines of division.

This balance is very sensitive and will weigh to the one-thousandth part of a grain. Holes are made in the wooden block to hold the blowpipe, pincettes, weights, charcoal, etc. The following table is to be used in connection with the balance:



THE POCKET BALANCE.

PROSPECTORS' AND MINERS' GOLD TABLE, TO DETERMINE FREE GOLD PER TON OF 2,000 POUNDS. SAMPLE FOR WORKING TEST, FOUR POUNDS AVOIRDUPOIS, 28,000 GRAINS.

Weight of Washed Gold—four-pound sample in grains and tenths.	Fineness, 870; value per oz., $16 12.	Fineness, 880; value per oz., $17 15.	Fineness, 875; value per oz., $18 08.	Fineness, 890; value per oz., $19 01.
5 grains	$83 97	$89 36	$94 20	$99 05
4 grains	67 18	71 49	75 36	79 24
3 grains	50 38	53 61	56 52	59 43
2 grains	33 59	35 74	37 68	39 62
1 grain	16 79	17 87	18 84	19 81
.9 grain	15 11	16 08	16 95	17 82
.8 grain	13 43	14 29	15 07	15 84
.7 grain	11 75	12 51	13 19	13 86
.6 grain	10 07	10 73	11 30	11 88
.5 grain	8 40	8 93	9 42	9 90
.4 grain	6 71	7 14	7 53	7 92
.3 grain	5 03	5 36	5 65	5 94
.2 grain	3 36	3 57	3 76	3 96
.1 grain	1 68	1 78	1 88	1 98

The following table is for determining the amount of free gold per ton of 2000 pounds average. Sample for washing, 29,166⅔ grains, approximately 4 pounds 2¾ ounces. Each grain of gold obtained after washing will, therefore, equal one ounce per ton. If the gold be—

750 fine, each ounce will be worth	$15 50
800 fine, " "	16 53
850 fine, " "	17 57
875 fine, " "	18 08
900 fine, " "	18 60
920 fine, " "	19 01
930 fine, " "	19 22
940 fine, " "	19 43
950 fine, " "	19 63

Hence, multiply the value per ounce by the number of grains to give the value per ton. Example: If the washed gold weighs 2 grains, and the fineness be known or estimated at say $16.53 per ounce, the sample shows $16.53×2=$33.06 per ton.

Tellurium.

Tellurium is found in small quantities all over the United States, commonly combined with gold, silver and bismuth. When present in ores of silver and gold, it renders their reduction by the process of amalgamation impracticable, so that smelting has to be resorted to. Copper bullion sometimes contains tellurium. Even when amounting to only $\frac{1}{100}$ of 1 per cent, it renders the copper so brittle as to be unfit for the finer uses, though it is good enough for castings. The business of freeing copper from the objectionable metal is conducted on a big scale, the largest works being located at Baltimore and at Bridgeport, Conn. From the copper in solution is precipitated a slime, consisting of gold, silver, arsenic, selenium and tellurium. The tellurium may be separated out by chemical means, but ordinarily it goes with the rest of the precipitate after the gold and silver have been saved.

Tellurium forms a remarkable alloy with aluminum. When the two are melted together in certain proportions, they suddenly combine with a loud explosion, forming a very brittle substance. This substance, when dropped into water, gives forth a peculiar and abominable odor. The same odor is communicated to the breath of anybody who swallows a small quantity of the alloy. The smell, in fact, is one of the worst producible in the laboratory, surpassing even sulphuretted hydrogen. Recently many experts in the science of chemistry have been trying to break it up, being convinced that it is in reality not an element but a compound of several elements unknown.

It is found in the Cripple Creek district, Colorado, and in Shasta county, this State. One of the Cripple Creek camps is named Telluride.

A peculiarity of tellurium is that a bit of it as big as a pin's head mixed with a pound of gold will make the latter as brittle as glass. Gold ordinarily is extremely tough, being so ductile that 900 square inches of ordinary commercial leaf are beaten out form a single dollar's worth. One of the most striking characteristics of tellurium is its extreme brittleness, as noted, both as regards copper and gold. It looks somewhat like silver and is very crystalline. It is slightly less heavy than iron.

NOTWITHSTANDING the depression of business in 1894, the United States exported $889,843,000 worth, against $847,665,194 in 1893. The English-speaking people of Europe bought of Americans $451,000,000 worth, and, taking British possessions altogether, they took $523,000,000 worth. The United States imported from Great Britain $107,000,000 in 1894, or sixteen per cent of our imports. Almost ninety per cent of the total United States exports were to the United Kingdom and British possessions, Germany, Canada, France, Netherlands and Belgium. Of imports, after the United Kingdom and British possessions, follows Germany with a valuation of $96,000,000; Spanish Indies, $82,000,000; Brazil and France, $76,000,000 each; and Canada, $37,000,000.

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J. F. HALLORAN.....General Manager

San Francisco, August 24, 1895.

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The Mineral Land Question.

On the 9th inst. the committee on protection to mineral lands of the California State Miners' Association was authorized at a meeting of the executive committee to consider an expressed desire on the part of the railroad company to arbitrate the question at issue between the corporation and the association as to what is and what is not mineral land in the unpatented area of Government land in this State. Representatives of the company were quoted as being desirous of reaching some amicable agreement, and, after considerable discussion it was finally decided that information be definitely obtained as to the corporation's attitude in the proposed arbitrament.

On the 20th inst. J. M. Wright, a member of the mineral land committee, addressed a letter to W. H. Mills, representing the S. P. and C. P. companies, asking him to state the corporation's views in the matter. The following day Mr. Mills replied at length, going over a part of the case in controversy. Speaking for the interests he represents, he recognized the existence of a grave dispute, and stated his desire to have such concurrent action by the corporation and the Miners' Association as would speedily, satisfactorily and definitely settle the entire question in a way that would be final and conclusive. In brief, his suggestions are that a preliminary examination of all the land in contest be made by experts; that these experts be two in number; the miners to appoint one, the corporation one, they to make thorough examination of the lists of land selected by the railroad company for Government patents; the Miners' Association to furnish satisfactory evidence that it is fully authorized to act for the miners of the State; that the joint report of the two examiners be binding on both the corporation and the miners, and their final findings be held and regarded by both sides as the legal basis of a final adjustment of the dispute before the Government or other legal officials; that as an essential requirement to this agreement and joint appointment the association shall cease all forms and modes of contest of the railroad's action or position in the matter of mineral lands; shall withdraw its affidavits, recede from its present position and in every way leave the matter, so far as the association and the miners are concerned, in precisely the position those matters were in before the mineral land committee began its present contest.

From his point of view Mr. Mills' requirements are logical and consistent. He represents the land department of the railroad company, is thoroughly conversant with the matter in all its details and fully understands words and their uses. He recites his willingness to arbitrate and couples his desire with the stipulations outlined above.

It is for the committee on mineral lands to make reply. It is for the five members of that committee to accept or reject the proposal, or suggest other terms of compromise. It is not a matter for individual notoriety or personal prominence. The committee is composed of intelligent, earnest men well informed on the subject and cognizant of their responsibility to the interests they represent.

To us it seems that the plan as outlined in Mr. Mills' letter is impossible of acceptance. It seems that to concede his stipulations would be a complete surrender of all for which the committee has fought, and an abandonment of the favorable position that has cost the association so much time, effort and money to secure. We are not expressing any opinion as to the wisdom of a compromise. Arbitration of any legal dispute when genuine is always less costly than adjudication by legal tribunals. Oftimes it is more satisfactory. It is usually swifter in results. But the proposition outlined by Mr. Mills in his letter of August 21st is onesided. Even to those who heartily favor compromise its objections are manifest. With no desire to oppose the idea in general, but looking at the matter from the miners' point of view, it is evident that were the committee on mineral land to accept the suggestion that it drop the fight, its members would make a grievous mistake. That corporation requirement alone appears to be an insuperable obstacle. To attempt elucidation of this plain proposition is unnecessary to those who understand the situation and useless to those who do not. Two commissioners are suggested, one from the miners, one from the company; both must agree; no provision is made for possible disagreement. There must be concurrence and unanimity of opinion throughout. If they disagree the whole scheme falls through. Meanwhile, in the possible event of their disagreement the miners would have abandoned the present contest, lost their present position and forfeited all right to renew representation of their claim. So that all that would be required for the railroad company to do that which it has so far failed to do—defeat, disintegrate or destroy the committee—would be to have the committee itself agree to Mr. Mills' proposition; rescind its action, abandon the contest, appoint a commissioner, let the company's commissioner disagree with the miners' commissioner, and the fight would be won—by the railroad company. The temptation to disagree would be a very strong one; it would be so easy, so natural, to decline to agree, and the results of such declination would be so valuable—to the railroad company.

Less could not be said: more need not be said. Sufficient is suggested to indicate that the acceptance of Mr. Mills' proposition in its present shape would be suicidal to the cause that the mineral land committee represents. Compromise is a good thing: arbitration has its merits: concession is worthy of consideration; but defeat is the same in its effect whatever the words or terms used in securing it.

A STRIKING CONTRAST between old and new mining and milling methods and conditions is afforded by the old bill in an Arizona mining camp, published in another column, and the report of the Alaska-Mexican Gold Mining Co. for '94. Alaska is more remote than Arizona, yet, last year that company worked 73,141 tons of low grade ore at an average cost per ton of $1.97½. This includes everything, and is illustrative of what skill and close management can do in a mine. Of that $1.97½ labor in the mine took less than 70 cents; supplies, 32¼ cents; labor in the mill took less than 24¼ cents; mill supplies, 33 cents; chlorination of concentrates cost 17¾ cents; "general expenses," 7¾ cents; the office in this city less than 1½ cents; bullion charges, 4 cents. Of course such a result would not be possible, even at the present day in Arizona; but it is worthy of note that in far-off Alaska, so remote from supplies of all kinds, a corporation was able to work in one year 73,141 tons ore that only yielded $2.79 per ton and yet make a profit of 81½ cents on each ton. Of the $2.79, $2.11 was free gold, the 68 cents coming from concentrated sulphurets. The year's profits were $59,640; the total receipts, $204,042.

"Is the Inventive Faculty a Myth?"

The above is the title of a thoughtful article in the current number of the *Engineering Magazine*, by W. H. Smyth of this city, in which he discusses the question affirmatively. He thinks that primarily there is no "inventive faculty;" that the ability to invent is not a special mental endowment nor the prerogative of genius, but that such faculty can be acquired by study and observation just as one would learn any mechanical pursuit which requires admixture of brains. It has been generally accepted as an unassailable proposition that "poets are born, not made," and similarly assumed in the case of inventors. Mr. Smyth argues that any rational human being possessed of the ability to see, remember and reason with accuracy can so use those mental qualifications as to assimilate principles already known in a concentration of purpose that may be classed as an "invention."

Here it becomes necessary to state with some degree of definiteness what is meant by the word "invention." Mr. Smyth's definition is a negative one. He quotes Prof. Robinson, who states that an invention is the "product of original thought," and holds that it is not; that invention is not creation, but intelligent selection, and may be the clever rearranging and adapting to new uses of principles already known, and from this premise proceeds to argue that by study and practice the power of invention may be strengthened and the process made more facile, and says: "It further follows that the operation of these faculties, like other processes, must be capable of being reduced to a definite system, governed by well-defined laws, with manifest advantage in respect to economy of time and effort and certainty of result."

The author goes on to argue that the most important prerequisite is the ability to know what to do and how to do it; to have a clear, exact idea of what is wanted and the trained skill to determine how to best supply the want. He proceeds to demonstrate with considerable strength the utility of his idea to form a scheme for the "Cultivation of Invention," or the "Science of Invention," incidentally suggesting that from patent law and patent practice should be eliminated the ordinarily accepted idea of "invention," substituting therefor "discovered" or "thought out," which would make the domain of "invention" more tangible and determinate. His suggestion of the course of mental training that would induce the ability to invent in the mind of any one of ordinary mental endowment is ingeniously stated and is worthy of study and respectful consideration.

A weed has been defined as "a plant whose uses are as yet undiscovered." Mr. Smyth's central idea is that there exists much in Nature for the trained eye and brain to educe and utilize, and that such adaptation, usually called "invention," is within the reach of the clear, cogent thinker. Looked at in the abstract, there is a great deal in the article with which to agree, and it is so worded that, if one cannot agree with all of it, he must at least accord merit to the idea and the mode of statement. In our opinion, however, the case is not proved. If one takes up special instances it appears manifest that great "inventions" have been made by gifted minds who must have been endowed with special ability that, in want of a better term, is styled "inventive faculty"—an ability that no amount of applied skill could more than supplement or aid.

In the closing part of his article, Mr. Smyth suggests the inauguration of "A Science of Invention," or a scheme for the "Cultivation of Invention," giving as a partial basis accurate and methodical observation; cultivation of memory, including the faculty of association; cultivation of clear visualization and logical reasoning from actual observation; and recommends a course of study with these ends in view. These suggestions are of value to the technical observer and in practice would undoubtedly be beneficial to the student or worker in any branch of applied mechanics.

DURING the week the American Bimetallic League held a convention in this city, attended by over 500 delegates from California and adjoining States. Several strong speeches were made for the free coinage of silver, a series of resolutions was adopted and the organization of a new political party discussed. It was determined to organize local bimetallic leagues and work for remonetization of silver.

"SHALL the California Miners' Association incorporate?" is a question well worth the attention of that body at its next annual convention.

Concentrates.

r Cripple Creek, Colorado, the quartz gold is finer than the er.

$150,000 FIRE devastated the mining town of Bingham, h, last Monday.

R. BENT, late foreman of the Le Roi mine, takes charge he El Plomo mine in Mexico.

HE Montana Ore Purchasing Company reports a July pro- tion of 1,457,000 pounds of copper.

HE annual meeting of the Nevada County Miners' Associa- will convene in Nevada City next Thursday.

AMES MALTMAN has leased the Lightner mine, adjoining the Utica on the north, and is now operating it.

V. KEELEY, of Vanderhilt, San Bernardino Co., has bonded mine, the Clementina, to a party of Englishmen.

HE Nelson *Tribune* says the proposition to erect a smelter he Upper Arrow lake will be laid over for a year.

PT. KERVIN, of the Hale & Norcross, has been looking at ephine county, Oregon, mines for the last two weeks.

OL. FRANK MCLAUGHLIN expects to get good present re- ns from sluicing at the Golden Feather, near Oroville.

HE Good Hope mine is working a daily force of twenty-five n. I. N. Boicourt of this city has been appointed superin- dent.

'94 San Bernardino, Riverside, San Diego and Los An- es counties produced $665,082 in gold. In '93 those counties duced $320,472.

HREE FORKS, a small mining town in the Slocan country, burned out completely last week, the inhabitants nar- ly escaping destruction.

HE Spokane Ore Co. has incorporated to operate in Trail ek, B. C., where they own twenty-three claims. The minal capital is $5,000,000.

. B. WEST has bought the Bode or Fellowcraft quartz e at San Andreas, Calaveras Co., for $4000, has men pump- it out and will sink deeper.

PT. HANLEY, of the Niagara mine, reports that the "lost n" has been found, which means considerable for French ch and that part of Shasta county.

A TWO-COMPARTMENT shaft is being sunk on the Turner mine Smith's Flat, Calaveras Co. Hoisting works and other chinery will be in place by September 1st.

V. A. CLARK has contracted for two additional furnaces to placed on his United Verde, Arizona, copper properties. It expected they will double the present output.

HE property of the Ruby Dunderberg Mining Company, ar Eureka, Nev., recently sold to close the business of the mpany, was bought in by the debenture holders.

A NORTHWEST MINERS' ASSOCIATION, modeled after the Cali- nia State Miners' Association, is proposed, to embrace all northwest Pacific States, with headquarters at Spokane, sh.

HE Old Flag Mining Company has incorporated to operate nes in Yuba county: capital stock $500,000: D. E. Miles, Stone, R. C. Walrath, E. C. Godfrey and J. V. Hunter are stees.

HE Austin, Nevada, *Reveille* says there are but very few e men in Austin at the present time, and every able-bodied n who sought a position has found one with the Austin ning Co.

WORK is to be resumed by J. W. C. Maxwell on the Ala- na mine, five miles from Sonora, Tuolumne Co. The mine ed to be a gold producer. There is an old 40-stamp mill on e property.

T is stated that either the Raymert Mining Company or e Columbia Company will erect a mill of sufficient capacity do the milling for both companies, in the Humbug mining trict, Arizona.

HE Last Chance mine, six miles from Prescott, Arizona, s been sold to Messrs. Levin, Dexter and Howes, of Chi- go, who will build a five-stamp mill. There is a four-foot ge of fair grade ore.

HE June gold output of the Witwatersrand, South Africa, nes is 200,941 ounces, 6000 ounces ahead of May. The Wit- tersrand local papers say the output of '95 will exceed $42,- 0,000. It looks that way.

CLARENCE S. KING, who recently bonded a group of mines in e Cargo Muchacho district, agreeing to pay $120,000 for em in six months if they held their richness, has assigned s contract to G. C. Tilden.

HE Reliance Mining and Reduction Company has incor- rated in San Jose: capital stock $100,000. Directors—S. B. ristry, E. McGrath, H. Kaler, W. H. Ham, E. F. Smith, . H. French and L. A. Sweet.

HE Bolivian tin mines are very rich, but they are gener- y situated at an altitude of 14,000 feet above the sea level, that, between high freights, lack of railroads and insuffi- ent capital, they are hardly developed at all.

HE Golden Star Mining Company has incorporated at ownieville, Sierra county; capital stock $100,000. Directors— M. George, Girard, Pa.; W. H. Sharp, London, Eng.; C. M. ilson, Asa Wilson, Downieville; V. Wallace, San Fran- sco.

DURING 1894 Calaveras county produced more gold than any her county in California. The aggregate output in gold of e county for the twelve months was $2,124,548. The prod- t of that county in '93 was $1,669,192. Its gold product in '92 as $794,531.

MINERS who make their own assays often find it difficult to rive quickly at the exact value of their ore, and such aders are referred to articles on that subject in the issues July 27, August 3, August 17, and the article on the first ge of this issue.

J. B. HARRISON, of Wakefield, Mass., has invented a non- rrosive pipe. The lining is of lead fastened to the interior pipes or pumps with an "elastic cement," which "contracts a degree proportionate to the expansion or contraction of he two metals which it unites." Where pipe is immersed in water containing sulphuric or other corroding acid, external corrosion cannot be prevented by that method, but where such a condition does not exist he claims practical indestructibility for his wares.

MRS. JOHN P. ST. JOHN, wife of the famous Prohibition ex-Governor, is at present, and has been for some time, superintending the engineering and other work of constructing a tunnel in a gold mine at Cripple Creek, in which her husband has a controlling interest.

THE employes of the Franklin copper mines at Houghton, Mich., have had their wages restored to the figure holding before the cut of 1893. A general cut was made in all copper mines of the district at that time, and it is thought that the restoration will soon be as general.

MANAGER DALY of the Daly-West, Utah, says that the order for the mill, with which that property is to be provided, will be placed next week, and its completion effected about the 1st of January next. There is considerable competition over the contract, for which bids are being solicited.

ORE SHIPMENTS hence from Mexico have been cut down considerably by the 5 per cent export duty imposed by the Mexican Government. Where steamers from Guaymas, Altata and Mazatlan formerly brought 400 or 500 tons of ore, they now bring less than one-fourth of that amount.

DURING the year ending July 30, '95, the mint at this city received 56,000 ounces more gold than for the corresponding twelve months. The figures from the Selby refinery exhibit additional proportionate increase. This is strikingly illustrative of the augmentation of the annual gold output of the State.

COLONEL SUTHERLAND, who is going to work the tailings at Candelaria by the centrifugal process, says the work of getting things in readiness for operation has been retarded on account of water. Workmen are digging ditch and laying pipe, and have completed the line as far as Basalt, several miles from Candelaria.

L. H. TAYLOR, of the United States Geological Survey, recently measured the volume of water in the Humboldt river at Golconda, Nevada, and found it to be 650 miners' inches. At its highest period this year, about the middle of May, the Humboldt's volume was 55,000 inches, which was less than one-half of its usual volume at high water.

BOISE, IDAHO, is probably the only town in the world whose streets are sprinkled with boiling water, and whose houses are supplied with hot and cold water from never-failing artesian wells. The hot water is also used for heating purposes in the winter. Sprinkling the streets with steaming water arouses the curiosity of all visitors who see the wagon for the first time.

W. B. MCSHERRY reports from Coulterville that Silas Stone and an armed posse have tried to jump the Crown Lead mine, Merced county, which he has had in charge. It is the property of the estate of the late Fred McCrellish, and is considered worth fighting over. At last accounts McSherry and four others had successfully repelled the Stone party with revolvers, and were camped on the field.

HEREAFTER the Montana prospector must dig a ten-foot hole upon his lead in order to hold his claim, exposing at least one wall of the vein. He has ninety days in which to record the notice of location, instead of twenty as heretofore. Omitting representation work will not be possible, for the jumper must do that much work when he relocates the claim. The work done by the previous owner will not count.

THE purchasers of the Planet and Satura claims in Fool's Gulch, Arizona, between the Congress and Yarnell mines, have incorporated under the name of the Planet-Saturn Mining Co. They are C. E. Clark, W. H. Sayward, E. D. Peters and W. A. Clark. The two claims cost $40,000, spot cash. Two shafts 900 feet apart will be sunk to a depth of 600 feet. The outcroppings show a decomposed oxidized iron, giving an assay in places of $175 to the ton.

DISCUSSING an article in last week's issue, in which it was suggested that the Anti-Debris Association's plans and purposes did not justify county aid, the Marysville *Democrat* closes by saying: "The *Democrat* believes that if the matter could be submitted to a vote of the people of Yuba county they would emphatically decide, as have the supervisors of Colusa county, that the appropriation from the treasury for the Anti-Debris Association is no longer necessary."

THE Katie mill and hoist at Basin, Montana, were burned on the 13th. Over 50 miners were in the mine at the time the hoist caught fire but all escaped without injury. Nine men were working on the 100 and knew nothing of the fire until Alex Glass, one of the owners, went down the west shaft and climbed to the 100 and notified them. The mill and hoist were completed this summer at a cost of over $100,000. The company carried $30,000 insurance and it is expected will again rebuild. The Hope mine and mill on the west was saved by hard work.

LAST TUESDAY the Virginia, Nev., Miners' Union adopted the following resolution: *Resolved*, That the Virginia City Miners' Union, in accord with the Knights of Labor of America and all labor organizations of the United States, by this preamble and resolutions, on and after the first day of September, 1895, do hereby create and maintain a boycott against all United States National bank notes, and pledges the Union and its members individually not to receive in payment of wages or other business transactions such notes, unless in such cases as are specially provided by law.

IT is again stated that the Revised Statutes of the United States (section 2,324), the present mining law of the land, provide that the period within which the work required to be done annually on unpatented mining claims shall commence on the 1st day of January succeeding the date of location of the claim. The enactments by Congress approved November 3, 1893, and July 18, 1894, were for the purpose only of exempting the miners from the penalty of forfeiture of their claims for not doing the assessment work in each of those years. Owners of such claims have until the 31st of December next to do the assessment work for 1895.

THE report of mineral resources issued by the Geological Survey says that antimonial ores have been found in a number of western States, chiefly in Arkansas, California, Idaho, Montana, Nevada and Utah, usually in the form of a sulphide, but also combined with iron, copper and lead. The product of the United States has risen from sixty tons in 1882 to 250 tons in 1894, valued at $45,000. Nearly the entire supply is from California. The production of platinum is still insignificant. The results of the examination of the black sands of Oregon beaches have proved a disappointment, the amount of platinum being scarcely noticeable, although the sand contains $1.55 in gold per ton.

THE Canadian Minister of Mines has sent to the recorders of the several mining divisions in Kootenay blanks which they are to fill in and return to the head of the mining bureau, if one should be appointed. The following are a few of the things on which the recorders must report: "Name of claims recorded since last report," "Owners," "Number of mining license," "Nature of ore," "Nature of hanging wall," "Nature of footwall," "Average width of seam," "Distance seam is traceable on surface," "Course of seam," "Strike of seam," and "Remarks." The Nelson *Tribune* suggests that the following be added: "Geological or formation period," "True fissure or gash vein," "Gangue," and "Assay value of ore." All of which the average discoverer of a mineral claim will, of course, know at the time of recording.

JNO. M. WRIGHT, a member of the committee for the protection of mineral lands, has written a letter to W. H. Mills, of the Southern Pacific Co., asking what definite proposition that corporation may desire to make regarding the determination of the question of the mineral character of that portion of the unpatented land in the State now in dispute. Mr. Mills in reply proposes a commission of two members to decide on what is mineral and what is non-mineral land; the Miners' Association to select one, the railroad company the other, both to agree. Meanwhile the association to abandon its contest and abrogate all present advantage gained, virtually conceding the whole thing to the company and putting the solution of the question into the hands of an adversary that sees itself seriously embarrassed by the energetic movements of a body that is now asked to commit suicide.

PROBABLY nothing in the world can be said to exceed in structural wonder of its kind the labyrinthian system of subsurface timbering peculiar to the Comstock, the sum of $55,000,000 being considered a moderate estimate of the cost of timbering the mines. The size of the timbers varies from 16 inches square and 24 feet long to the smaller pieces 8 inches square used in cribbing. The species employed are chiefly yellow pine, fir and cedar, fully two-thirds of the whole amount being the first named. Yellow pine has been taken from the lower levels of these mines so compacted by the enormous pressure it has withstood as to have a density and weight exceeding those of lignum vitæ. None of the timbers in the Comstock mines have yet badly decayed, and their life there cannot be accurately determined, but the heat and vapors of the mines appear to have a preservative effect.

ON Warm creek, Idaho, about four miles from American Falls, there is some novel mining going on. The ground which is a light granite soil, is plowed, scraped into a dump and then shoveled into sluices. There are ten men at work and they run two shifts, making $75 per shift. The peculiar thing about this is that it is the only instance in Snake river mining where gold is found in large and paying quantities in the soil. Heretofore it has always been the practice with miners to strip off the soil to a depth of from three to ten feet or more, according to the formation. It is against the experience and science of miners to find placer gold anywhere except in gravel, and usually miners would not look for it anywhere else. The man who made the discovery on Warm Creek is not a miner, but "gold is where you find it." There is a great amount of mining all along Snake river in the vicinity of American Falls this season.

ARIZONA can furnish a pretty good story as well as pretty good mines. Among the mines of Arizona was the famous Vulture, now the property of H. A. W. Tabor, fifteen miles southwest of Wickenburg, whence the ores were taken by wagon to be milled on the bank of the Hassayampa. The mine is credited with having produced over $10,000,000 in gold. In those days nothing save the best was milled, and in the waste dumps was found the building material for the town of Vulture. The mine worked on for a score of years with varying fortune, the town maintaining a large population, when the pipe line from the Hassayampa was washed away by the flood that followed the breaking of the Walnut Grove dam, the 100-stamp mill was closed down and the camp was deserted. Three years ago T. E. Farish secured a two years' lease of the property, fitted up ten of the stamps, put in a gasoline engine, got his water out of the mine and started to "cayoting" on the lower levels. Near the end of his lease he ran out of really good ore. In this extremity he bethought himself of the scores of tenantless houses. Every one was constructed of free milling iron oxide gold ore, and specimens chipped from the corners assayed an average of $20 to the ton. The veracious chronicler of the Hassayampa avers that for the last ninety days his stamp mill has run solely upon building material, much to the profit of its owner.

THE death of two mining papers in Denver, Colorado, and the consolidation of another, moves the *Mining Industry* of that city to say that it is "the oldest mining journal in the West." This brings up the question, "What is 'The West'?" "Where does 'The West' begin?" It is a question that has occasioned some recent discussion. The Boston *Traveler* says: "The West does not begin nowadays until the middle of Ohio, at least." The Salt Lake *Tribune* says: "The West does not begin until the Mississippi is crossed, and it is not quite certain that it begins until the Missouri is crossed." The Kansas City *Star* observes: "The West begins where it always did, and the Boston *Traveler* is much nearer right as to the eastern boundary than the Salt Lake *Tribune*." The *Star* goes on to say: "The political beginning of the West was the establishment of the great free Northwest Territory. The soon-to-be States of Ohio, Indiana and Illinois constituted the original Great West, as well defined as China or Japan. That country is still the original West, with additions and enlargements like Michigan and Wisconsin, and will always be the West. The Boston *Traveler* takes the view entertained by New England when people from that section began to move to Ohio. When the founders of Marietta went forth they were going to the West, and the northern strip of Ohio, filled at first with Connecticut people, was the 'Western Reserve.' The boundary has never been removed." Meanwhile, unhampered by sectional lines, the MINING AND SCIENTIFIC PRESS is the oldest mining journal on the American continent.

The Mines of Tuolumne County.

By Our Traveling Correspondent.

Entering the county at Robinson's Ferry, the first mines encountered are the pocket mines on Jackass hill. The greater portion of the hill is owned by Jim Gillis, the "Truthful James" of fame, who leases out the ground for 25 per cent of the returns.

The only vein on the hill that looks like a milling proposition is the Atlas, which is now under bond to Hale & Co. Old Fred Morris milled the surface of the vein in days gone by, and, his millman states, took out $11 to $24 a ton. The shaft and cuts show a series of quartz stringers carrying 5 to 15 per cent of sulphurets. The mine wants 300 feet of additional depth, when these stringers will either get together and make a vein or give out. The fact that all the pocket stringers on the hill pitch to and in depth must cut this vein leads the pocket miners to believe that in depth it will be a bonanza. There is a small camp of pocket miners on the hill at this time, but none are in pockets, though some of them have been peggiug away for three years without seeing the color. It is the size of the pockets found on this hill that encourages the miners to persevere, as but one pocket is needed to give them a good stake.

At Sonora, the Golden Gate is now in charge of S. Smitherum, the court having placed the Fisher interests in possession. He states that by driving a crosscut of 22 feet he cut the vein and got it rich as ever in the past. The shaft is now down 700 feet, with levels run 700 feet on the vein, all in good ore. The 10-stamp mill is crushing 22 tons a day, while the chlorination works handle the sulphurets, the mine being almost entirely a sulphuret proposition. The vein to the north and south is not developed.

North on the Stanislaus, J. S. Sublett has bonded his Chimney Rock Cons. to Messrs. Gould & Doyle, of Sonora, who are developing the same. The vein lies between granite and talc slate and shows visible gold very freely. To the east, the Starr mine has been sufficiently developed that the owners are about to erect a mill. This vein yielded very high grade rebellious ore in its past history. South and west, W. Shanwood is operating the Keltz and Ham & Birney mines.

At Soulsbyville, the Black Oak is reported bonded to Tom Ewing for $250,000. This mine has a large vein of heavily sulphureted ore, with 10-stamp mill. The old Soulsby is being reopened at the Pennsylvania shaft. In cleaning out the shaft quartz has been found that assays $100 a ton, confirming the reports that the ore from this shaft went $100 to the ton. The hoist is now up and work will be pushed with all possible speed, as the rainy season will drown out the present pump, though they have but to move the old Soulsby pump onto the shaft to handle all the mine's water.

This shaft was abandoned at 80 feet in the early days. Various theories are given, some that the vein faulted, others that it split and the wrong vein was followed. The fact remains that on the Soulsby shaft, north, the vein was worked to a depth of 800 feet and $3,000,000 extracted. It seems probable that the vein pinched and the miners stopped, instead of sinking on the seam until the vein came in again, as they did at the Sou sby shaft.

Just east of Soulsbyville, Messrs. Hill & Hill are taking the water out of the old Louisiana mine. At the Stud Horse the shaft is now down 1400 feet, with very good ore going to the mill. This section is all above Sonora in the granite belt. South the mother lode courses through the country, which at no time made the showing that it now does. I know of no section on the lode where there are so many mines with as rich ore as they show.

The Rawhide, from a value of $5000 at the time the present owners took hold of it, has made its owners wealthy and increased in value to $2,000,000. The bond that was on the property expired on the 7th of July, the parties failing to put up the $50,000 for it, and thus conferring a favor on the owners. As previously stated, the plant on the Rawhide is the most extensive and complete of any property in the county. Adjoining the Rawbide on the north is the Rappahannock, the property of Mr. R. Chute, a gentleman whom it is a pleasure to meet. Mr. Chute has his shaft now down 360 feet and is sinking. The shaft was put down on the hanging wall. At 30 feet a 4-foot vein was crosscut; at 50 feet, a 4-foot vein; at 80 feet, a 2-foot vein; at 200 feet, a vein came in wider than the shaft for 60 feet; at 345 feet, a 5-foot vein was crosscut. As the shaft goes down all of the veins of the mother lode will be crosscut, and when sufficient depth has been secured crosscuts will be run to the vein and levels extended. On the mine the veins are very modest, hiding their heads throughout the entire length of the mine, but a shallow crosscut shows them up in good width. The mine has a good hoist. To the north of the Rappahannock is a long stretch on the lode that is idle and should be given depth. Northeast, and about 1200 feet from the mother lode, Mr. J. L. Whitney is opening up the Darrow mine. His shaft is now down 125 feet. The vein has widened very rapidly in last 25 feet. At the time of my visit they had just put off a shot and the quartz thrown out was full of leaf gold in white quartz, similar to the famous Idaho mine of Grass Valley. Mr. Whitney pounds out an average of $100 a day from the rock extracted in sinking. Following the rich eighteen-inch vein of quartz are numerous small seams of quartz which, with the slate, carry a large per cent of sulphurets that assay $168 to the ton. Everything indicates a milling proposition of good size, and at 150 feet a crosscut will be driven to prove it. A hoist has been erected and two three-stamp batteries are on the ground for the mill. South of the Rawhide is Rawhide No. 2, the property of Alvinza Hayward and the Hobart estate, on which nothing is being done. Still south follows the Alabama (idle) and then the Crystalline, now being developed by a tunnel by Messrs. Rapp and Shafer. They have a very good shoot of ore and only need development. South is the old mine of the Seebers, which is being opened at its south end. Then follows the Gem, for a long time operated by Mr. Harris and now worked by his family at a good profit. Next is the Tyro of Alvinza Hayward, a mine that has been gouged out all along and across its surface by the pocket miners and that made Whiskey hill famous. This, too, is idle. From this the lode runs to Quartz mountain and the new town of Hent. The first property to the north is the Dutch, A. Grittenbach superintendent. The company has just erected a small but first-class mill to test the veins as they are developed. The surface shows all the veins within the mine's side lines close to the center and but a few feet apart at the shaft. The shaft is on the west vein, which is generally conceded to be the poorest, though the bottom of the shaft shows very good ore and will now be put down to 500 feet, when it will only be necessary to drive a short crosscut to cut the other three veins and work them all through this shaft. As the east vein is generally the bonanza vein of the lode, the Dutch stands to make a big winning as the shaft goes down and the crosscuts go east. With the App down 800 feet at the south end of the Dutch and in good ore, there is no more promising property on the lode than the Dutch, and time will place it with the best of the mother lode mines. Immediately south is the App, operated by the Rawhide Co. The shaft went down through several hundred feet of vein until the present shoot was cut, which shows up well at 800 feet, and the company is now straightening the shaft and gradiug for a large hoist.

South follows the Knox & Boyle, Grey Eagle and Holmes & Miller mines, operated by the Napa Quicksilver Co., with Mr. W. A. Holmes in charge of the group, which is known as the Santa Ysabell. The mines are opened by tunnels driven in from both sides of Quartz mountain, with chambers at the terminus for electric hoists on the Knox & Boyle. South on their Holmes & Miller two shafts have been put down and will now have electric hoists erected. The company has three known shoots of good ore to commence with. At present Mr. Holmes is erecting the poles for their electric plant, which will soon be in place. They have their own water for power, and a bright future is before them. South is the Erin Go Bragh, which has a shaft going down. Then follows the Golden Rule, E. R. Stent superintendent. This mine is well named, great masses of quartz and diabase showing seams passing through them with continuous streaks of gold, while a huge chest shows hundreds of pounds of quartz filled with gold. While these very rich masses are put to one side, the ten-stamp mill pounds out an average of $22 a ton from the remaining rock. Mr. Stent counts the shoot good for 1100 feet in length, and justly asks "Where is there a better mine on the mother lode?"

South is the New Era, with shaft down 65 feet and sinking; then the Jumper, with H. W. Coffin superintendent. This mine has "jumped" into prominence by the large amount of gold it has yielded from the small amount of work done on the mine. The shaft is now down 145 feet on the 12 to 18 foot vein and drifts 130 feet. A ten-stamp mill has been erected, and the month's run has given the fortunate owner an average of $26 a ton. The ore is of the same character as the Golden Rule—quartz and diabase—and the showing in very rich rock alike. This covers Quartz mountain and the new town of Stent, or what has been known as Poverty Hill. There is no point on the lode where there is the same showing of so many rich mines as this immediate section from the Dutch on the north to the Jumper on the south now shows. In this section the veins pitch to the east, while the slate seams cut across from the southwest to the northeast, thus throwing the shoots north instead of south, as elsewhere on the lode. South of the Jumper there is nothing doing until Jacksonville is reached. Here the Mammoth Mining Co. is pursuing the even tenor of its way in the development of its property by tunnels.

The Eagle and Shawmut, that adjoin on the north, have recently been bonded, and are being developed. South is a long stretch of idle lode to the old Wheeler Hill mine, in charge of F. H. Hill of Chinese Camp. Mr. Hill is just getting into shape to work, and, as he was absent at the time, I did not secure any information in regard to the mine. South of this along Moccasin creek to Mariposa county, and on down through Mariposa to Coulterville, is a long stretch of undeveloped mother lode open to location. West of the mother lode about five miles, and about opposite to the Rappahannock, Mr. T. M. Lane of Angels has bonded the Pino Blanco and is proceeding to develop the mine. There is a big blowout of quartz here that forms a hill in itself. In this hill an open cut has been driven in the past and some very rich pockets extracted.

Passing south to that justly famous hotel, Priest's, we feast the inner man and drive out to the old town of Big Oak Flat. Here the miners sluiced off and up the side of the mountain until a quartz boulder got in their way and had to be broken up. In its separation $11,000 was extracted, and the Scorpion mine discovered in '54—a strong ledge that yielded numerous pockets to a depth of 60 feet, when, on account of the water, the work was stopped. Recently, Mr. A. Mack has come back to his first love and erected a hoist on the mine and will give it depth. The mine is now known as the Mack mine. While the owner keeps his weather eye open for the pockets, the seven-foot vein carries a good per cent of sulphurets that assay $253 a ton, which, with the gold in the vein, outside of the pockets, makes it a very fine proposition. Just north is the Longfellow, which, like the Mack, has only been worked to water level and has given over $120,000 in pockets. It is now idle. Big Oak Flat rests on her laurels and waits for the Mack mine to waken her from her present slumber.

Taking the county as a whole, the mining outlook steadily grows brighter as mine after mine is developed and shown to be valuable. For the courtesy shown your correspondent by every person I called upon in the county, I take this opportunity to express my thanks. E. H. SCHAEFFLE.

Murphys, Cal., July 29, 1895.

Mariposa County.

From Our Traveling Correspondent.

Entering the county from Priests, no mines are encountered until Coulterville is reached. Here the Merced Gold M. Co., T. M. Couch, general manager, have secured the mines on the mother lode formerly owned by the Cook estate. The mines cover both branches of the mother lode, which are here over a mile apart, and about 2½ miles on each vein, with Coulterville about in the center of the property, which is composed of twenty full claims.

To operate the mines they have secured the Big Oak Flat ditch, which has its source in the Tuolumne river at a point about thirty miles northeast of Coulterville, and have an electric power station on the Merced river, to the south. At present, the shaft on the Louise, at Coulterville, is down 22[illegible] feet, with boilers in place and grading done for large hoist. This is on what is known as the east vein thigh. There is still another vein about 75 feet east of this ledge. South about 1½ miles another shaft is down about 400 feet on the Mary Harrison, while to the northwest, on the west vein a shaft and tunnel are driven on the Malvina, and a large hoist is in course of erection. South, on the Potosi, a tunnel is being driven through the mountain.

While all the work may be said to be preliminary, the whole shows that it is in the hands of experienced operators, who do not hold out $5 in one hand and expect $20 in the other, but expect to put up, and put into, the mines every dollar that can be invested to a profit. All of the machinery is massive and of good quality.

The rush which first took place to Coulterville has subsided, and many are leaving. It takes time to develop a mine and do it properly, and it will be a of two years before Mr. Couch gets this extensive plant in full operation. When that time comes Coulterville will come to the front and speak for itself in its bullion output.

South and west of the Potosi is the Tyro, John McLaughlin, superintendent. This is an old mine. The present company have pumped it out, put the shaft down to 600 feet, and are sinking to the 700 foot level. The Tyro's reputation is that of an exceedingly rich mine.

Northwest of Coulterville about ten miles is the Louisiana, G. W. McKenzie and J. D. Gore, proprietors. The mine has an 85 and 160-foot shaft down on a 5 to 40-foot vein, between a porphyry hanging and a metallic slate foot wall, with a gouge one to three feet wide. The property is called a fine proposition and is under bond at this time.

Owing to the extreme heat (105° to 112° F.), I did not go south of Coulterville. As is known, there is nothing below Coulterville, save at Hornitos. The lower part of the county is covered by the Mariposa grant, which bars out all mining in that vicinity. There is a great deal of virgin ground in the north of the county that only needs water to make it a desirable section to develop. This can be secured, capital, from the Tuolumne river. If the ground should fall into the hands of a company like the rustlers from Montana who are now awaken Coulterville, Mariposa would soon be as well known for her mines as she is for her grove of big trees and famous Yosemite. E. H. SCHAEFFLE

Murphys, Cal., July 29, 1895.

Oregon's Gold Beaches.

The sea beaches of Oregon have been the recent subject of investigation by the Geological Survey. I. V. Winchell and F. F. Sharpless were sent three months ago to explore these sands, concerniug the possibilities of which as a source of wealth there has been much speculation. They report them to contain not only gold, but also considerable quantities of platinum, as well as other rare and precious metals. In one spot they report 50,000 tons of sand that holds two to five per cent of garnets and rubies.

Messrs. Winchell and Sharpless report that in their opinion the gold and platinum might be extracted profitably from these beaches, while the rubies and garnets would be valuable in the manufacture of emery wheels.

The sands of the Pacific seashore are rich in gold from Mendocino in northern California to the mouth of the Umpqua river in Oregon. Cliffs on the ocean front commonly contain gold; where washed by the waves, the shore for miles actually glitters with speckles of the yellow metal. What appears to-day, however, is either washed away or deeply buried to-morrow. Many attempts have been made to extract the precious stuff from the sands, but, as a rule, they have been unprofitable. The metal-bearing strata are some distance below the surface, and the overlying material is apt to be washed back by the sea as fast as it is removed.

In a few places such work is still carried on at intervals, and each year these beaches contribute something to the world's store of gold. The locality upon which Messrs. Sharpless aud Winchell bestowed their chief attention was near the mouth of the Coquille river, in the southwesteru part of Oregon. The tract here explored extends along the sea coast for two miles, and runs about an equal distance inland. Digging discloses the fact that the sands are divided into well-defined layers, and in them are embedded many stumps and trunks of trees, some of them of the gigantic redwood. Naturally, the metals. being heavy, occur in the deeper strata. Gold and platinum are found mostly in a layer of black sand which varies in thickness from a few inches to twelve feet. On top of the black sand is a stratum of gray sand which is not so rich.

The gold in these sands occurs in the shape of minute scales. These yellow flakes are so extremely small and thin that frequently they will float in water, on account of minute air bubbles which collect upon them. Some of them are almost microscopic, and often they have the form of small cups or basins. Here has been a fruitful cause of disappointment to miners. When a prospector under ordinary circumstances finds twenty or thirty specks of gold in his pan, he assumes that the material would yield at least $2 to $3 to the cubic yard. These sea beach scales are so very thiu that the average value of 600 "colors" is only one cent. It is a remarkably large "color" or scale that measures an eighth of an inch in diameter.

The sands in the locality described have been washed and scoured very clean, having been subjected to the action of the Coquille river and of the waves of the Pacific. Their accumulation at this point has beeu caused by the opposing forces of the river and the ocean. The deposits have been laid down within the age of men, as is proved by the character of the tree trunks and geological indications. Careful tests demonstrated that to work the gray sands would not pay, inasmuch as it yielded only seven cents a ton on an average. The black sands, however, hold from 50 to 75 cents in gold per ton, and their treatments for its extraction is regarded as a problem worthy of serious consideration.

A good deal of platinum is found associated with the gold in these beach sands. At preseut market rates it is worth $6 an ounce. A couple of years ago a big syndicate bought up the entire visible supply of this metal, actually setting out to purchase all the scrap platinum existing in the world. But there was more of the latter than had been counted upon, so it was found impossible to control the market. This speculation carried the price of the substance up to $18 an ounce—a circumstance very annoying to scientific men. who use it for instrumeuts of precision and especially for chemical apparatus, inasmuch as it will stand the fire of the blowpipe aud does not corrode. Electricians also utilize quantities of platinum—an inch of wire for each incandescent lamp, in connection with telegraphic instruments, aud in every place where the passage of a spark creates ozone to oxidize the metal poiuts it passes between.

Messrs. Winchell and Sharpless express the opinion that platinum could be extracted from the sands at the mouth of the Coquille river at a profit. It is found on the Pacific coast wherever gold occurs, though its distribution is not uniform, much being discovered in some places and very little in others. Samples submitted to test yielded two ounces of platinum to the ton of sand, which is enough to pay. Four-fifths of the platinum that supplies the world is obtained from two mines in the Ural mountains, Siberia. They are gold mines, the platinum being a by-product. Both metals are got from "placer" deposits, being found mingled with the sands that have been worn away from the hills by running water. Twenty-nine hundred carloads of earth must be washed to yield fifteen pounds of platinum. Nuggets are very rare.

Samples of sand assayed by the two experts yielded small quantities of those rare metals, iridium and osmium, but it is very doubtful whether they could be extracted profitably. Iridium is now quoted in the market at $15 an ounce, and osmium at $60 au ounce. The latter, it will be observed, is nearly three times as precious as gold. Iridium and platinum are the only metals that are heavier than gold. The former is utilized to some extent for making scientific instruments, not being susceptible to corrosiou.

In the beach sands described are found considerable quantities of a very extraordinary white metal, or rather mixture of metals. This uatural alloy, known as "iridosmium," is composed of iridium, osmium, rhodium, platinum and rutheuium. Rhodium, by the way, is quoted at $112 an ounce; but it is by no means the most precious of metals, gallium being worth $3000 an ounce. These metals are mere laboratory curiosities, however; the prices are nominal, inasmuch as there is almost no market for them. The only important use for iridosmium is in tipping gold pens. It is employed in this way because it resists acids. For the purpose mentioned the grains of it, which are flat, like gold-dust, are picked out from the sand with magnifying glasses.

It should be mentioned that the sands of all beaches contain gold, though the quantity is usually too small to pay for separating it. There is so much gold in sea water that a single bucketful of it reveals a yellow trace on analysis. Every ton of water in the ocean contains about one grain of gold, which is enough to gild 56 square iuches of surface; or it may be drawn out into 500 feet of wire.

The suggestion to the effect that the rubies and garnets in these sands might be utilized in the manufacture of abrasives is an important one. In 1893 there were 1713 tons of emery produced in this country, worth $83 per ton. The value of the emery imported during the same year amounted to $127,767. Rubies are better than emery as a material for emery wheels. The sands all along the coast of Oregon hold a large percentage of magnetic iron. This is easily separated by means of magnets, and the invention of the electric furnace has made it practicable to smelt it. Eventually it may become feasible to concentrate the sands from the iron, producing steel of exceptioually fine quality for certain purposes aud saving the gold and platinum as by-products.

Old-Time Arizona Prices.

Near Chaparral, Arizona, recently, au old prospector, looking over some papers in the office of the Belcher mine, found an old bill, yellow with age, of which the following is a copy:

MINERSVILLE, May 14, 1867.

Big Bug Mining and Milling Co.:

1000 lbs. flour @ $35 per cwt.	$350 00
2 sacks bacon @ $2.10 ₱ lb.	105 00
30 lb coffee @ 60c ₱ lb.	18 00
2 5-lb cans baking powder	10 00
1 sack sugar, 120 lbs., @ 40c	48 00
1 sack beans, 100 lbs., @ 40c	40 00
25 lbs. dried apples @ 75c	18 75
3 gallons syrup	12 00
5 lbs. tea @ $2 ₱ lb.	10 00
2 hams, 30 lbs., @ 75c	22 50
20 lbs. salt @ 35c	7 00
1 box pepper	2 00
20 lbs. dried peaches	20 00
2 shovels	7 00
4 picks	16 00
4 pick handles	5 00
3 joints of 6-inch stove pipe	6 00
One-half doz. tin plates	3 00
Freight on com., 105 lbs	26 25

Fifteen cents a pouud freight was paid on a stamp mill weighing many tous, $6 a day to the miners and as much more for as many guards to watch the Indians. The wonder is any mine paid there at any price for the product. At present, in the same regiou, a miue can be worked as cheaply for labor and supplies as in any part of the coast.

THE ANCIENT EGYPTIANS must have been well informed as to the qualities of the precious metals. In M. Berthelet's analysis of the gold necklace which the Princess Noub-Hotep wore he finds that there was 82.94 per cent of gold, 16.56 of silver and 0.50 of copper. King Kor-Fou-Ab-Ra's coffin was covered with gold leaf, which was composed of 85.92 per cent of gold, 13.78 of silver and 0.30 of copper. The silver diadem found with the Princess Noub-Hotep contained 69.19 per cent of silver. The actual quantity of silver in au object can only be determiued approximately, because through time the metal becomes in part converted into a chloride.

THE gum on the back of the postage stamps of the United States is made from alcohol one part, acetic acid one part, dextrine two parts and water five parts.

New Trade Catalogues.

Fulton Engineering & Shipbuilding Works, 213 First St., San Francisco: Illustrated descriptivo catalogue of mining machinery, includiug ore buckets, water buckets, miuing ore car, car wheels and axles, self-dumping incline and vertical skip, single and double-deck hoisting cage, ore bin gate, hoisting tramway, incline gravity tramway, horse powers, portable mining hoist, Pelton water wheel hoist, pony and reel hoists, Cornish pumps, triple-throw mining pump driven by electric power, horizontal tubular boiler, Deane pumps, etc.; 96 pages, 6x9 inches, with tables of sizes and prices.

Risdon Iron Works, Beale and Howard Streets, San Francisco: Catalogue No. 7 (3d edition), illustrating and describing grizzlies, rock-breakers, ore feeders, shoes aud dies, stamp batteries, rotorts, melting furnaces, prospectiug mills, the Johnston concentrator, chlorination mills, wet and dry crushing silver mills, the Boss amalgamation process, roasting furnaces—Buckner, Stetefeldt aud O'Hara, lixiviation process, Bryan roller mill, arrastras, percussion tables, siziug screens, crushing rollers, hydraulic separators, water wheels, waterjacket furnaces, hydraulic giants and elevators, mining cars, wire ropeways, etc.; 136 pages, 7x10 inches, with complete detailed description of machinery for mining, milling and reduction of gold, silver and copper ore, comparative cost, useful plans, tables, formulæ, etc.

Law Battery Co., 39 Cortlandt St., New York: Illustrated treatise on electrical batteries and electro-therapeutical apparatus, adapted mostly for experimental and laboratory work, 52 pages, 7x10 iuches.

The Edward P. Allis Co., Reliance Works, Milwaukee, Wis., D. B. Hanson, Mgr., 9 Fremont St., San Francisco: Illustrated catalogue of miniug, milling and smelting machinery, Reynolds-Corliss engines, Blake, Allis, Gates and Dodge crushers, Allis crushing rolls, mortars, prospecting mills, amalgamating apparatus, steam stamps, jigs and screens, the Reliance and Castlenau concentrators, Pearce and Howell-White furnaces, miuiug cages, ore cars, blowers, boilers, mine pumping and hoisting engines, air pumps, condensers and compressors, rock drills, etc.; 128 pages, 6x9, profusely illustrated, with tables of sizes, prices, and detailed description.

Clayton Air Compressor Works, 26 Cortlandt St., New York: A revised treatise on "The Widening Use of Compressed Air," with additional matter regarding its prominence and success as utilized for power purposes, includiug numerous testimonials, advertisements of business firms, etc., handsomely illustrated; 104 pages, 8x11 inches.

Chas. D. Mosher, No. 1 Broadway, New York: A treatise on the steam separator, its object, action and applicatiou, showiug its principles, efficiency and econonomy of operation; 40 pages, 4x6 inches.

Sullivan Machinery Co., 54-60 N. Clinton St., Chicago, Ill.: The Sullivan prospecting core drill is illustrated and described, with directions as to puttiug it up and running it; portable hoilers and steam pumps, portable forges, etc., are also treated in detail; 84 pages, 7x10 inches.

The Parke & Lacy Co., 21 and 23 Fremont St., San Francisco: Catalogue No. 70, illustrating and describiug the process of pumping water hy compressed air with the Pohle air lift pump; a treatise on the subject of raising water by that power and its practical application through the pump described, with numerous testimouials, specifications of different dimensions of Ingersoll-Sergeant air compressors, with details as to construction and prices, profusely illustrated with eugravings and sectional drawings; 36 pages, 8x11 inches.

The Ferracute Machine Co., Oberlin Smith president, Bridgeton, N. J.: Catalogue No. 11, an illuminated description of over 300 kinds and sizes of presses, foot and power lathes, beaders, dies for working har aud sheet metal, artistically produced, with full information as to prices, styles, etc.; 36 pages, 10x13 inches.

The M. C. Bullock Mf'g Co., 1171 Lake St., Chicago, Ill.: Catalogue No. 27 (3d edition), a finely illustrated descriptiou of the central valve engine, the Gunning & Campbell eugine, reproduction of results of a test of Siemens-Willans dynamo and engine, with other up-to-date information; 40 pages, 8x10 inches.

Recent Additions to Collection of California State Mining Bureau.

Limonite, showing a very beautiful wavy and banded structure; Calaveras Co., Cal.; W. H. Storms.

Fossils illustrating the geology of the Santa Paula oil region.

Hydro-dolomite, crystallized; corner of Webster and Ridley Sts., San Francisco; S. H. Herring.

Limonite from a volcanic crater of unknown depth near Reno, Nevada; C. L. Canfield.

Several specimens of auriferous pyrrhotite; the ore of the uew Trail Creek district, Rossland, B. C.; H. Adam.

Very superior clay with about 40% of alumina from Castella, Shasta Co., Cal.; L. N. Girard.

Twelve specimens ores and minerals from the State Sehool of Mines, Golden, Colorado, includiug typical Cripple Creek gold quartz with tellurides and fluorspar, natrolite, native silver, etc., etc.

Gold quartz, high grade; Gold Chief mine; Goff's district, San Bernardino Co.; Mrs. J. Young.

"Plum-blossom rock;" sent from Kyoto, Japan, by Miss L. Garvin.

And many others. HENRY S. DURDEN, Sec'y.

THE Manchester ship canal does not earn enough to pay interest ou the bonds issued to build it; and the Corinth canal does not even pay its operating expenses. The North German canal is too new to have a record yet. But Russia, regardless of discouraging precedents, is considering the idea of an artificial waterway 1,000 miles long, conuecting rivers that empty into the Black and Baltic seas.

Two students at Cornell University recently made a steam engiue that yielded one-horse power for every 11.67 pounds of steam consumed. Professor Schrœter, of Munich, has beaten this record by superheating the steam to 670 degrees Fahrenheit. He used only 10.2 pounds of steam per indicated horse power.

Mining Summary.

CALIFORNIA.

Amador.

BONDED.—I. R. Bearce has bonded the Poker Bill quartz claim to San Francisco men. It adjoins the old Contraras mine, which formerly yielded $350,000.

JACKSON DISTRICT.

THE GOOD HOPE.—Chas. Peters is pumping water out of the shaft of the Good Hope mine. He bas a reservoir on the creek above the mine for water power with which to run the pump.

Butte.

THE CATSKILL MINE.—The Catskill mine is reported to be turning out gold at the rate of $2.50 a pan.

SELLING DUST.—*Times:* There is an an unusual amount of dust coming in for this season of the year. The banks say that most of the dust they handle is brought in by white men in amounts ranging from $10 to $250 at a time. The average price paid is $17.50 an ounce, though some gold runs higher. T. L. Vinton, at Cherokee, pays $18 in trade for gold from the Spring Valley placer mine, which is considered the purest gold in the section.

CRUSHING ORE.—J. S. Williams, who has a contract to crush twenty tons of ore for the Spring Valley mine, finished the contract last Saturday. The quartz ran lower than was expected, but it should be remembered that it did not come from the main lead. Saturday he crushed 500 pounds of surface croppings from the main lead, which yielded $36.

T. J. Sparks will begin crushing the remainder of the ore on the dump in a day or two. It is expected that work will be resumed in the tunnel in a few days.

THE GOLD BANK.—A French syndicate is reported to have made H. P. Snow a handsome offer for the Gold Bank mine at Forbestown, which was taken under advisement.

Calaveras.

MINE EXTENSIONS BONDED.—The McSorley brothers have given a three years' working bond of the Gwin mine extensions Nos. 1 and and 2, to M. B. Kerr for $30,000, one-half of the net proceeds to be paid to the owners until the sale is consummated. This property adjoins the Gwin on the south and consists of 2250 linear feet of vein. It is proposed to put up machinery of the same capacity as the Gwin and commence sinking at once. Although the property has never been prospected beyond a depth of 100 fect the indications are good.

GENERAL NOTES.—The hoisting works at the Edna mine are finished. The whim's lifting capacity is 1200 pounds to a 100-pound strain. Two shifts are at work sinking the shaft and will be kept going until the 200-foot mark is reached.

Ford brothers have bonded the Big Pine mine. The Leonard brothers worked the ground some years ago and in a week took out four pounds of gold, one piece containing $76. Several attempts have been made to purchase the Leonard mine, now owned by an eastern company, but the only answer to all advances is that the property is not for sale.

The contractors who are digging the ditch for the Donnollan mine will soon have the contract finished. It is reported that ten more stamps will he added to the Donnallan mill.

The Thorn mine was pumped out this week, and parties are now examiniug it.

The pumps at the Utica are working night and day, but it will be a month before the mine is dry. Water is being pumped from the Stickle and south shafts through the north shaft.

Work on the Thorpe mine is being steadily pushed. The shaft is down 350 feet and the ledge shows up well.

Del Norte.

BLACK SAND MINING.—The Del Norte *Record* thus describes the process used in extracting gold from black beach sand near Crescent City by Edw. Yates:

Mr. Yates is at present working seven men. They were engaged at time of visit in "stripping"—that is, throwing to one side the sand not thought worth while working, in order to get at better paying material. When the good sand is reached it is carried to the "dump box" and thrown in. The water falling on tbis, washes it to the next box known as the "tom." A piece of perforated iron at the lower end of the "tom," permits the sand to pass through onto two plain sheets of copper, covered with quicksilver—the stones being held back in the "tom" and thrown away. From the plain copper sheets the sand is washed to the next drop—which consists of about five feet of corrugated copper, amalgamated with quicksilver. The gold is retained on these copper plates—only a very small percentage being lost. The sand is washed from the corrugated plates onto what is known as the "blanket" and from thence carried off and thrown to one side.

The copper plates are then taken in and warmed, then scraped, and in this manner the gold is secured. Mr. Yates is at present running three wheelbarrows, and disposing of about twenty tons of sand a day. The average yield to each wheelbarrow in sand mining is from five to seven dollars a day.

El Dorado.

THE CHANNEL BEND CO.—*Gazette:* The Channel Bend Mining Company, near Volcanoville, has eight men at work running a drift tunnel into the gravel beds, building roads, flumes, etc., preparatory to working the mine.

Lassen.

DIAMOND MOUNTAIN.—There is some interest in the Diamond Mountain mines. The mill is running at the Union Mine. Judge Goodwin and son have recently become interested in the Lone Pine mine with J. R. Perkins, and will develop it.

Mariposa.

GENERAL NOTES.— The new twenty-stamp Whitlock mill is in operation. There are seventy men employed. The employes are mainly Cornishmen, who have been with the company heretofore in Plumas county. They are industrious and self-respecting.

Gazette: The company composed of Messrs. A. G. Clough, Ed. Nordgren, Frank Thorne, John Marshal and O. F. Griffin, which recently purchased the Horseshoe mine in Hunter's valley, is pushing work ahead rapidly. Twelve men are employed in the mine and a ten-stamp mill is already in process of erection, while the new boarding house is nearly completed. It will be but a few weeks before the work of crushing ore will begin, and the ledge is reported to be rich and improving in quality as greater depth is reached.

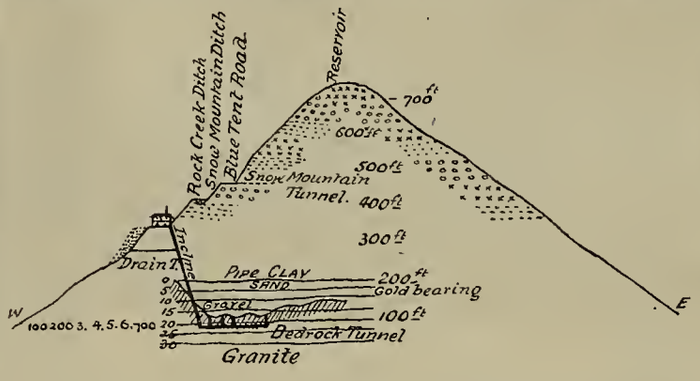
Messrs. Austin and Brown, of Fresno, who purchased the Barn Gulch mine in the Sherlocks district a few months ago, have been working steadily on the property. A depth of seventy feet was reached this week, when very rich ore was found.

E. H. McGregor, of San Jose, amalgamator for the Whitlock mine, arrived last week and has assumed his duties there.

Nevada.

THE GOLD BANK TUNNEL.—J. R. Dickinson, who recently went to London, is reported to have succeeded in getting an English company to take a controlling interest in the stock of the Gold Bank Tunnel, and that they will put up $250,000 to put it through. The idea is to start on the South Yuba river, run under the mines on Deer creek and eventually reach Grass Valley. The distance is about four miles and the depth attained would be 2000 feet.

THE ODIN MINE.—Superintendent Hesse tells the *Transcript* that good gravel is being taken from the Odin mine. Although the gravel prospects well and occasionally pieces of coarse gold are fouud, the gravel is not from the main channel for which the company have been running so long. From the prospecting that has been done it has been demonstrated that in order to strike the channel properly it will be necessary to sink a new shaft.



SECTION THROUGH ODIN CHANNEL, HARMONY RANGE, NEVADA COUNTY.

GOING TO START AGAIN.—*Transcript:* The owners of the Boss mine, near North San Juan, have made complete arrangements to resume work on their mine next week.

STRUCK IT RICH.—S. M. Grall and H. Deniker have struck a very rich quartz ledge on what is known as the White Ranch near Montezuma hill. This section abounds in rich quartz ledges.

THE PROVIDENCE.—The Providence mine is looking better now than ever during the long term of years that it had been worked. A large shoot of splendid quartz, which was struck not long ago, is furnishing an abundance of ore and has lately increased in size and richness. Thirty-five stamps have been running in the mill for some time, and in a few days all forty will be pounding away. The remaining five stamps are now being put in working order. It is thought that quartz can be taken out of the mine fast enough to keep the mill running at its full capacity for some time. Over 100 men are employed and everything in the mine and in the mill and chlorination works is being managed carefully and systematically.

BOUGHT IT CHEAP.—*Transcript:* The Pittsburg mine and the Pittsburg Extension, together with the buildings, mill and machinery of all kinds, have been bought at constable's sale to satisfy a judgment obtained by Robert Hollaud, he buying it for $307.62.

Plumas.

MINES BONDED.—The Claybank, America and St. Louis, drift mines at La Porte, are bonded to J. H. Thomas, of Oakland.

THE HIBERNIA MINE.—Gullie and Hook have twenty-five men at work on the old Hibernia property, near Greenville, making general improvements preparatory to crushing.

San Diego.

IN THE PICACHO BASIN.—The Old Blossom mine is turning out rich ore from its 12-foot vein.

It is thought that the Ogilby district will have three more quartz mills built there this year.

The Figueros mine at Pot Holes, twelve miles above Yuma, on the Colorado, has been sold to Davis & Wetmore for $36,000. They will build a 10-stamp mill. The shaft is down 72 feet; the ore averages $19 per ton.

The old Dahlonega mine at Buena Vista is to have a 10-stamp mill. Beatty & Co. own the property.

Louis Jaeger is sinking a new shaft on his Oro Grande mine.

BANNER DISTRICT.

Stewart, Egan and Moulton, have bought the Ranchita mine. The property has been in litigation for some time but all conflicting interests have been satisfied. The mine has not been worked to any considerable extent.

C. F. Holland, of San Diego, has bought out the interest of Santillanes, Lopez, and Savoria in the Elebada mine, and is now directing operations.

San Bernardino.

SUIT BROUGHT.—Employes of the Gold Bronze mine, Vanderbilt district, have brought suit to recover $2720.50 claimed to be due for labor.

Shasta.

WORK AT IRON MOUNTAIN.—*Free Press:* Work is being pushed by the Mountain Mining company in all the different departments. They have four camps now, one of graders for the smelters, one of graders for the roadbed of their narrow-guage railroad, one of surveyors, and the big camp at the mine. They have about fifty men at work grading for the railroad, who have completed their work from Iron Mountain to the Hidden Treasure mine. We understand that the company expects the grading to be completed in three months.

Sonoma.

PAINT AND PLUMBAGO.—The paint mine near Healdsburg is being worked up to six tons milled a day. Recently while breaking ground for the foundation of the new paint mill a vein of plumbago was discovered. The find has not been developed.

Siskiyou.

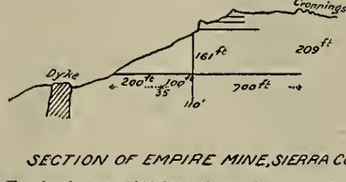
The Blue Gravel mine at Greenhorn, about a mile south of Yreka, has yielded about $60,000 in all, and only 700 feet of ground partially worked at that.

Songer & Dame, of the Pacific mine, Klamath river, have engaged a new crew of 21 more men for their claim, in putting up another derrick.

Sierra.

THE EXCELSIOR CLEAN-UP.—*Democrat:* Last week's clean-up at the Excelsior mine was the largest ever had at that mine. The total output this season will reach nearly $10,000. The season was an unusually short one, they having had but about fifty day's water, and during that time with not a full head. The future outlook for this mine is very bright.

THE EMPIRE MINE.—Renewed attention is attracted to the Empire mine, the five-foot vein in shaft No. 2 showing good ore. The Empire is over 7000 feet above the sea and the difficulty of carrying supplies over a pack trail and the deep snows of the winters make progress necessarily slow.



SECTION OF EMPIRE MINE, SIERRA CO.

Trinity.

THE GILZEAN QUARTZ MINE.—Chas. Gilzean, from Deadwood, tells the *Journal* that at the Gilzean mine the lower tunnel has tapped the ledge at a depth of 35 feet, distant about 20 feet from under the pay shoot in the upper tunnel. The ledge where tapped is from 12 to 18 inches in width and is good milling ore.

Tuolumne.

ATTRACTING ATTENTION. — *Independent:* Messrs. Gorrie and Merrille, from the Anaconda Mining Co., of Butte, Montana, have been examining mines in this county the past two weeks. They have concluded to take hold of several properties which they will develop, and if found as represented, will purchase. Mr. Louis Chervillon, civil and mining engineer, from Paris, France, has been examining mines, with the view of purchase for a Frence syndicate. He was well satisfied with the properties he experted, and has reported favorably to his company, who will, under advice, probably invest in Tuolumne.

Mr. Rose, of San Francisco, and Mr. A. D. Glace, of Oakland, have both been inspecting our mining resources, with a view of investing. The above gentlemen came in the interest of the Tuolumne Mining Bureau, and more due. The Bureau are doing their utmost to bring capitalists into this county.

NEVADA.

THE COMO TUNNEL.—*Enterprise:* Work has begun on the tunnel which will drain the Como mines. The mouth of the tunnel is near the spring at Palmyra. It will be run east of north a distance of 900 feet, at which point it will intersect the ledge in Palmyra ground. The tunnel project is the conception of Colonel Boyle, superintendent of the Alta. The ledge at Como is a true fissure vein of mineralized quartz. It runs north 30° east. Near the Palmyra mine, and easily accessible to the tunnel, are the North Rapidan and Maxwell mines, owned by Colonel Boyle, and the Mt. Como and three other claims, recently bonded by an English syndicate. The Palmyra mine is also bonded hy the same syndicate. The tunnel is intended to be a key to the whole situation at Como, as the Sutro tunnel is to the Comstock.

ESMERALDA COUNTY.

INSUFFICIENT CAPACITY.—Hawthorne *Bulletin:* The mill at Douglass is not of sufficient capacity to handle one-quarter of the output, and many of the miners have large quantities of ore on the dump, waiting their turn.

LINCOLN COUNTY.

The preparatory work going on at the Summit smelter and Old Timer mine, west of Pioche, means much work for that town. The intention is to work the Old Timer, Halfmoon and probably some of the mines in the vicinity, primarily for the gold in the ores, with the lead and silver to be extracted thereafter. The cyanide process is to be used, and tanks to work ten tons a day will be placed in the Summit smelter works of the Pioche Consolidated Mining Company.

OREGON.

ACTIVITY AT SIXES.—At Salmon Mountain and Sixes there are about 150 men at work, and most of them are doing well. Sam Currier has an exceeding rich quartz claim near the Divilbiss quartz mill, and he has taken out over $1000 worth of free gold during the last month with a small mortar.

JACKSON COUNTY.

Supt. James has a small force of men at work at the Ashland mine.

The Tolo Mining Co's. effects are being sold for debt. The wood, hydraulic pipe, etc., were sold a few days since to satisfy the claim of Mr. Potter of Rock Point precinct. Reid, Milner & Co. have telegraphed from Tacoma that they will settle everything.

Ladd & Williams of Gold Hill district cleaned up $1700 the season's run at their placer mine.

Beckman & Huffer's quartz mill will be in operation next month.

Hull, Beck & Pelton of Louse creek have struck a rich body of ore in their quartz mine and bave taken out several hundred dollars.

The Lucky Bart and Rita mines in Sardine creek district are being operated with a small force, and the ore is being crushed by J. H. Breeman at the Lindley mill.

The Sterling Mining Co. have commenced cleaning bedrock and will be so employed for the next six weeks. The prospects are good for a favorable result.

N. H. Spencer of Griffin creek, who has been prospecting a graphite proposition, has run a cut of about forty feet and struck a five-foot ledge, which has the appearance of being permanent and shows a good quality of ore.

R. F. Yocum and Dr. Pearce of Poorman's creek will cut a four-mile ditch from Griffin creek this fall. It will raise the supply to enough for six months' work.

W. H. Reid of Tacoma, Wash., is straightening out the business of the Tolo Mining Co.

ALASKA.

GOLD ON THE KOWAK.—A new gold field has been found in Alaska, on the Kowak river, about 200 miles from its mouth. Three men took out $500 in two weeks in coarse gold last fall and returned there last spring.

SAYS THEY WERE DECEIVED.—G. Peterson, Seattle, Wash., recently returned from Alaska, says there are hundreds of men at the head of Cooks Inlet penniless and in danger of starvation: that Beatty, another Seattle man, narrowly escaped lynching at the hands of the miners. He took a party of ten miners to Cooks Inlet and promised that they should be paid at the rate of $30 a month. When the men got there they found the rate was $3 a day, although the employers paying it were steadily losing money and rapidly abandoning work. Beatty's men went on a strike and he let them go. Subsequently they offered to work at any price, and the return of several prospecting parties with discouraging news made the men desperate and there was considerable talk of lynching Beatty.

BRITISH COLUMBIA.

GENERAL NOTES.—Ashcroft *Journal:* Lyons and Murphy have commenced work with a gold dredge at Rusty Bar, about six miles down the river from Ashcroft.

The Ottawa Hydraulic Company at Boston Bar, below North Bend, has completed a grade of three miles, on which a flume will be laid to convey water to the mine. The machinery will be taken across the river by cable.

Between 12,000 and 14,000 pounds of dynamite went in last week to the Horse Fly mines. The cement streak for which this powder was required is getting thinner as work progresses. Fossils of an ancient typ

have encouraged Manager Hobson to believe that they are working on the true alluvial deposits.

By snowfall the Southern Kootenay will be well prospected. Hundreds of men are at work, mostly prospectors of experience.

A private letter from Barkerville states that all the men available at Barkerville are working for the Cariboo Gold Fields Company, Mr. Whittier manager, and will be till winter sets in; still it is doubtful whether it is advisable for men to go up looking for work. There is a report that the Island Mountain quartz mill will be repaired this winter to start up next summer, and also the Black Jack quartz mine. The Sheppards expect to clean up 300 or 400 ounces of gold this season on Sheep creek, at the head of Downie's pass. Mr. Newton, on Stout's gulch, half a mile from Barkerville, cleaned up 400 ounces some time ago, and it is reported that he will have 200 or 300 ounces more this season.

IDAHO.

THE SITUATION AT WARDNER.—(Special Correspondence:) The Miners' Union, that had things pretty much their own way for the past year or so, is making its last kick. The Bunker Hill and Sullivan mines are working a full complement of men and are running their large concentrator night and day. There are plenty of men to be had at $3 per day, and good miners, too. The Hunter mine at Mullan is running and has all the men that it needs, and more, too. They are paying the same wages as the Wardner mines. The Emma and Last Chance at Wardner are running, and have a good lot of miners, and can get all they need and as fast as they want them. Board and lodging at the hotels is $7 per week; at the company's boarding-house, $6 per week, bunk room free. The people who pay the taxes and support the country have become tired of being run by a lot of unreliable agitators and have quietly sat down upon them. Our governor, being a good, loyal American citizen, has spoken in plain English to the would-be leaders of men, and they have subsided because they well know that the governor means business. These agitators are the cause of the reduction of wages in this country more than any other one thing. The mine owners were willing to settle the whole controversy upon a basis of $3.00 and $3.50 for carmen and miners, but the leaders of the unions said no, it must be $3.50 all round or nothing, no matter what the price of lead or silver might be. The mine owners said, We will pay $3.00 and $3.50 a day as long as we can, and when we can't we will shut down and say nothing. The union said No! so the mine owner had just as much of a fight to make if he tried to run and pay $3.00 and $3.50 as he would at $2.50 and $3.00, so, of course, as long as it was fight, why it might as well be for an object; and at the same time, under the present prices of their product, $2.50 and $3.00 per day was better wages than was being paid anywhere else in the United States under the same conditions. The companies have agreed to raise the wages to the old scale as soon as prices of lead and silver justify it. Within the past six weeks 400 men have gone to work, and before the first of September there will probably be 200 more on the pay-rolls. There will be no trouble, and men, whether they belong to the union or not, will not be molested. This is not satisfactory to the agitators, but the majority of the members of the union and the free American citizens of the country are pleased with the present conditions, and the fact that the troubles are settled and the messenger of peace is abroad in the land tends to make everybody happy, excepting, of course, the agitator. There are directly employed in the mines about 1400 men; add to this number those employed as lumbermen, wood-choppers, teamsters, etc., and it will bring the total up to about 2000 men actually at work at the present time. This number will be gradually increased to in the neighborhood of 3000. The day of the dynamite agitator is past and he is out of a job in the Cœur d'Alenes. The people who have the welfare of the country at heart feel jubilant over the prospects of a bright future and over the fact that murder and riot are things of the past in Shoshone county. Thanks to Governor McConnell and to the law-abiding citizens of the county who have seen the right and have not been afraid to speak out without fear or favor.

Wallace, Idaho, Aug. 18th, '95.

AROUND WARDNER.—At no time in the last three years has there been such a feeling of confidence in the Cœur d'Alene country in general, and in Wardner in particular, as now. The Hunter mine has resumed operations: it is expected that the Morning mine will follow very soon. These two mines will employ about 400 men.

There are now in the employ of the Bunker Hill company over 300 men and more are coming in daily, most of them from California. The company thus far has not shipped a great deal of ore, as a large force of men has been constantly on development work. The company has ordered a large amount of machinery and is putting the mine in shape for continuous running.

At the Last Chance mine men are being put on as fast as they can be used to advantage.

MONTANA.

JEFFERSON COUNTY.

Jefferson county produced, in 1894, 8,111.464 fine ounces of gold, worth $167,678.84. During the same twelve months the county produced 765,483.04 fine ounces of silver, at a coinage value of $989,715.44, a combined precious metal output for the year of $1,157,394.28.

SOUTH DAKOTA.

THE HARNEY PEAK TIN MINE SUIT.—Dr. A. R. Le Doux, the receiver of the Harney Peak company's properties has returned from England. The American and English stockholders are as far from a settlement as the day when the latter made application to the United States Court for a receiver. Their difficulties will now be settled in court, and the case will be tried in October in New York.

DIVIDEND PAYERS. — Black Hills *Times:* There are at least twenty separate mines, exclusive of the Homestake, paying monthly dividends, ranging from $1,000 to $8,000. The mines are principally owned by private individuals, who reside in the Hills, and as a majority of them are not incorporated stock companies, no published knowledge reaches the outside world of what is actually being accomplished, as in the leading mining journals of the country we see the Homestake quoted as the only dividend paying mine in South Dakota.

GOLDEN REWARD.—*Pioneer:* Work on the Golden Reward mines, which was abandoned a few days ago on account of the superabundance of ore at the works, will be resumed some time the last of this week. The cyanide works of the company will start up on the 22d and as soon as the increased crushing capacity is ready will run continuously. At present it is impossible to crush sufficient ore for both the chlorination and cyanide plants, so that it is only when several tons of ore are crushed for the chlorination works ahead that the cyanide works can be run.

UTAH.

SOME UTAH MINES.—I. K. Clark and associates, who bonded the Stewart No. 2 at Bingham for $150,000, have put into operation a reduction plant which, it is claimed, will solve the problem of treating Bingham's low-grade gold ores. After the ore has been crushed by rock breakers and stamps it passes over copper plates, which save the free gold. The tailings are then pulverized by a patent process, in which pulverizing stones imported from Norway are used. The tailings are then treated by amalgamation.

The Ontario and Daly mines, under one management, produced during the month of July $145,000. It is a matter of uncertainty when the Ontario will resume the payment of dividends, as the great drain tunnel, which has cost millions of dollars, and which now drains the present workings, is being pushed farther into the mountain for the purpose of draining a large area of virgin ground.

Negotiations are on foot for a settlement of the difficulties of the Salt Lake Copper Plant company. The amount expended on the plant, which is now in the hands of a receiver, was $381,000, and the claims against it aggregate nearly $300,000.

TO BE SOLD.—Nephi *Times:* The Ibex smelter at Leamington is to be sold. This was ordered by Chief Justice Merritt in his decision on the report of Receiver Humphries last Tuesday. The smelter has been run at a loss ever since the Posey-Underwood syndicate took charge, and the losses have been greater since Receiver Humphries has been in possession. The plant is valued at $60,000, and the claims against it aggregate something like $80,000. Of this sum $11,100 is due the laborers at the smelter for wages.

Last Tuesday the smelter was closed down for good. Its last short run entailed a loss of about $7000. Thirty-one thousand pounds of bullion and four cars of matte went north from the smelter this week and 8000 tons of ore are on the ground at the smelter which will be a dead loss.

COLORADO.

FOUR MILLS BUSY.—The cyanide mills at Florence and the De Lamar and El Paso mills in Cripple Creek have hundreds of tons of low grade ore on their platforms waiting for treatment. Low grades, which it has not been found advisable to ship to the smelters, and ore which will grade anything above $10 can be treated at any of these mills at a fair profit.

ARIZONA.

THE OLD DOMINION.—The new owners of the Old Dominion Copper Company, have a mine which has yielded 65,000,000 pounds of copper. The present shaft is to be enlarged to a three-compartment shaft and sunk to the depth of 1000 feet. The copper bullion produced by this company as it comes from the furnaces runs, on an average, 98¼ per cent fine, which is the purest copper made in Arizona.

SILVER PROPERTIES. — Prescott *Journal-Miner:* Inquiries for silver properties in this section are on the increase, and if silver keeps up to its present price, even, it will not be long until some of the old-time silver producers will be worked again. The difference in the cost of transportation and treatment over that of a few years ago, will compensate for the depreciation in the value of the white metal, which has taken place in the same time.

C. J. Clark, of Denver, president of the Admiral Gold Mining Company, is out at the Bradshaw mountains having some work done on the Admiral lode, one of the company's claims. At a depth of 30 feet from the surface a three-foot streak of ore was encountered which assays as high as $72 per ton. In sinking 20 feet 25 tons of ore were taken out. With each foot of sinking, the quality of the ore is improving. The ore is being worked by the Liston mill. Some beautiful specimens were found, which gives every indication that the mine is another one of Old Bradshaw's treasures.

YAVAPAI COUNTY.

Courier: One thousand dollars cash was yesterday paid to John F. Osenberg for one-fourth interest in one of fourteen claims situated in the Congress mining district, the purchaser being J. F. Holden, of California. A group of three claims well developed will be bonded for ninety days, as soon as parties arrive here from California, for $35,000.

SCOTLAND.

KILDONAN GOLD MINES. — Under date of August 9th our Edinburgh correspondent writes:

The period for which the Duke of Sutherland allowed the County Council to test the Kildonan gold fields has expired. During the past few weeks the number of diggers had increased to seven, but none of them had been working under the conditions laid down at the opening of the scheme. They had been washing mostly in the bed of the Suisgill burn. One of the Helmsdale diggers, who began work when the diggings opened, has cleared up from £18 to £20 worth of gold as his three months' work. Several have made fairly good wages, but one or two have done practically nothing.

The seven diggers at work have handed to Mr. Seton, station master, Kildonan, altogether about 15 ounces. Only three or four of the men worked the whole time, and during the first few weeks they were simply prospecting in Suisgill burn and quarrying out in the parts they thought richest in the bottom of the burn. Though they have had claims of 40 square yards measured out to them, none of them have stuck to their claims, and the Dunrobin authorities refuse to recognize the experiment as satisfactory. A week or two ago they began "washing" out the "dirt" quarried, but spates stopped them at this work, and they are, therefore, to go on for some time yet until they have finished this, if they are not interdicted before that time, as they declare they are doing no harm to anything, their operations being confined strictly to the bottom of the burn. They are getting up to the work and are quite enthusiastic in declaring that now they can make good wages, and this although the apparatus they have is primitive in the extreme. The gold is of a beautiful rich color, and they expect to sell it at four guineas per ounce. Unfortunately, on Tuesday the hut which David Mackenzie, Inchture, Perthshire, an old Ballarat digger, built for himself caught fire, and all his belongings were burnt; and it was only by the concentrated efforts of the gang that the fire was put out after burning about a hundred square yards of the heather behind it. The experiment so far has only wetted the men's desire, and they much regret that they will have to give up work, which they declare has paid them well, and which was promising to yield them even better than in the past.

He adds: "The Council seem to me to have been too parsimonious, and to have lost their chance a good deal, for, instead of hiring a practical miner and giving the matter a scientific trial, they advertised for miners, who were to work at their own charges, to give up part of any gold found, and to quit at the end of three months.

"It remains to be seen whether or not the Council think this show of gold from the diggers' operations will warrant them going further into the matter, and, perhaps, leasing the ground and sluicing it."

Coast Industrial Notes.

—Oregon's coal product in 1894 was 47,521 tons; value $183,914.

—Barlow & Curtis of Tacoma will mine coal on their property at Chehalis, Wash.

—Seattle, Wash., has 169 manufacturing establishments, which employ 2288 people.

—J. B. Stetson and Lovell White head a project to construct a railroad to the top of Mount Tamalpais.

—Borings for gas and oil four miles north of Livermore, Alameda Co., indicate the existence there of large quantities of both.

—The Boca Mill Company has a contract for 1000 M. feet lumber to be used in the construction of flumes, dams, etc., for the Nevada County Electric Power Company.

—Claus Spreckels is having cleared the lot corner 3rd and Market streets, which recently cost him $306,000, on which he will erect a fifteen-story building at a cost of $500,000.

—The Consumers' Light and Power Company of Spokane, Wash., has a contract with the General Electric Company, Schenectady, N. Y., for an electric plant to cost $100,000.

—A flour milling company is now paying wheat growers in Riverside and San Diego counties about $5000 weekly for grain. Crude petroleum is being used for power in milling this grain.

—The Shore Line Bicycle Railroad Company expects to build ninety miles between here and Santa Cruz. The promotors of the road are said to have constructed a similar line on Long Island.

—The Sierra Valley Railroad Company has executed a mortgage in favor of the California Safe Deposit Company for $1,000,000 to secure a redemption of 1000 bonds at $1000 each to be issued by the company.

—The Stanislaus and San Joaquin Water Company has floated $350,000 in bonds here. A mortgage on all the property of the company was last week filed at the Recorder's office to guarantee their payment.

—The United States Circuit Court, Northern District of New York, has reversed the decision of the Board of Appraisers, which decided that cedar from British Columbia was subject to an advalorem duty of 20 per cent.

—The Board of Directors of the San Francisco and San Joaquin Valley Railroad gave contracts for 1,500,000 feet of lumber last Wednesday, to be used principally in building the bridges over the Tuolumne and Stanislaus.

—The Southern California motor road of San Bernardino has been sold to the Pacific Improvement Company for $167,100. The sale was made by the master in chancery of the United States District Court of Southern California.

—The Mexican Government is giving attention to extending its various waterways so as to develop inland navigation. General John B. Frisbie, of this city, has received a concession for an electric railway from Julopa, on the Interoceanic railway, to Coroba, in the Santa Cruz railway passage, through an extensive coffee and fruit country. Survey and construction will begin immediately. George Topham has the engineering in charge. This is the first electric railway projected in the republic.

—On October 1st the Pennsylvania, the Southern and the Southern Pacific will unite in a semi-weekly limited train service between New York and San Francisco, leaving New York on Tuesdays and Saturdays. A saving of three hours over present schedules is promised.

—The Gig Harbor lumber mill, which has long lain idle, was sold recently to the Port Blakely Mill Company. The plant originally cost $126,000 and brought $9000—an example of what the northwest country has had to meet through hard times and depression in the lumber trade.

—The King Hill Con. G. M. Co. has incorporated under the laws of West Virginia, capital stock $1,000,000. I. B. Newcomb is president, George V. Sims secretary, Rooms 32-33, Mills Building, New York. The company is organized to purchase and develop the King Hill and Golden Chariot, near Placerville, Boise county, Idaho.

—The Los Angeles Consolidated Electric Railroad was sold last Monday to Captain A. M. Payson, manager of the Pacific Rolling Mills, as representative of the holders of $1,500,000 of bonds, or one-half of the face value of the issue. There were two bids. Captain Payson had a certified check for $150,000 on the Bank of California to make the first payment.

—The Albion Lumber Company of this city recently sent a sample block of redwood to Indianapolis, Ind., accompanied by a letter asking that it be included in the material to be bid upon for the North Meridian street block pavement. The Board was favorably impressed with the sample, and decided to admit the wood in competition.

—Consul Hale at Guaymas, Mexico, informs the State Department that the consular district represented by him is in a very prosperous condition. The mines are making liberal shipments of ores and bullion. The big irrigation ditch on the Yaqui river is nearing completion. The American steamers plying between Guaymas and San Francisco are doing a good business.

—The Columbia river salmon pack aggregates 500,000 cases, of which 90 per cent is chinook. The packers and fishermen are well satisfied with the season's work. The packers estimate that they have packed at least 100,000 cases more than they have bargained to sell. The 3000 fishermen along the lower Columbia have been paid in cash $1,500,000 for raw fish in four months' time.

—The assessments for 1895 of the nine counties comprising southern California are as follows: Los Angeles county, $82,344,875; Riverside county, $12,081,322; San Bernardino county, $14,209,502; Orange county, $10,054,845; San Diego county, $23,090,144; Ventura county, $7,719,113; Santa Barbara county, $13,039,685; Kern county, $14,080,855; San Luis Obispo county, $13,787,865.

—About September 1st the largest powder blast ever exploded in southern California will be touched off at the Otay dam in San Diego county. This powder charge of over 24,000 pounds it is expected will dislodge at least 150,000 tons of rock. The dam, of which this rock will form a part, will impound 21,000,000,000 gallons of water. It is a part of the great irrigation system of the Mt. Tecarte Water Company.

—A very odd pavement is one just completed at Chino, Cal., made mostly of molasses, a refuse product of the beet sugar factory, hitherto believed to be of no value. It is mixed with sand to about the consistency of asphalt and laid like an asphalt pavement. The composition dries quickly, becomes hard, and remains so. The peculiar point of it is that the sun makes it drier and harder, instead of softening it, as might be expected. A block of the composition several feet long, a foot wide, and one inch thick, was submitted to severe tests and stood them well.

—Engineers have completed the survey of the proposed railway line that is to give Astoria, Oregon, railroad connection. The work of securing the right of way for the proposed line is well under way and in about three weeks the contract will be let for the construction work. The line, which is being built by A. B. Hammond of Missoula, together with his associates, will run from Astoria to Gobel on the south side of the Columbia river, a distance of about sixty miles. Across the river on the north side is Kalama. Here the new line will connect with the Northern Pacific, giving Astoria and the country tributary a direct line into Portland. The proposed new line when completed will cost about $2,000,000. It is expected that the work of construction will be commenced next month, and the road rushed to completion to be in readiness early next season.

—Z. S. Spaulding, a sugar planter, has made a cable proposition to the Hawaiian Government to build from San Francisco to Honolulu a branch line, to be built connecting the other islands of the group. He wants $50,000 a year for twenty years, the Government to have the right to use both systems for the transmission of official messages, free of charge, up to the sum mentioned per annum, reckoning at the regular rates charged. One clause provides for the exclusive privilege of landing cables on this territory for the term of twenty years, such privilege not to be construed, however, as conflicting with any rights the Government of the United States may possess by virtue of any existing treaty. The promoter agrees to have the cable in working order by October 31, 1898, if he is successful in obtaining subsidies from both the United States and Hawaii. The United States Congress will be asked to appropriate $100,000 a year for twenty years. The Hawaiians have accepted the proposition in a modified form.

Scientific Progress.

Light-Draft Gunboats.

Naval officials are calling attention, in view of the riotiug at Haw Sang and other places in China, to the great valne of light-draft gunboats for jnst such service as they might now be able to render if there were any available on the Asiatic station. The Min river, near which Haw Sang is situated, is very shallow and is not navigable except to old-fashioned flat-bottom stern wheelers, but there are many other Chinese rivers, and rivers of other countries with which the United States might become involved in trouble, which are navigable to vessels drawing ten or twelve feet. The Government is now having built at Newport News two gunboats drawing nine feet ten inches. These could be of service for such work. The great difficulty, as some of the naval officers point out, with all the vessels built for the United States navy is that, according to the laws under which they are constructed, they are to show a specified draft under a "normal" displacemeut. This "normal" displacement is construed by the builders as per lightest possible condition. A vessel with a "normal" displacement, for instance, of 7500 tons and a draft of twenty-one feet will, when coaled and ready for service, show a displacement of perhaps 9000 tons and a draft of twenty-three or twenty-four feet. The cruiser Columbia that, according to the law under which she was constructed, showed a displacement of 7350 tons and a draft of about twenty-two feet, on her recent trip across the Atlantic, with her coal bunkers full, had a displacement of about 8800 tons and a draft of about twenty-six feet. According to the records of the department, the Philadelphia has never been down to the "normal" displacement since her trial trip. At the nearest approach to it her coal bunkers were nearly empty. Had they been absolntely so she would have shown but twenty-three tons below her normal displacement.

"Congress," says a naval officer, "should indicate the displacement and draft of a vessel to be constructed as it would be when loaded and ready for sea. The 'normal' displacement is a fiction and an imposition."

Cans made of paper pulp are being introduced to take the place of tin cans for containing all kinds of preserved products. The occasional cases of poisoning from canned foods are due to the contents becoming tainted through the cans not being air-tight. Many millions of tin cans are used annually by canned goods factories in this country, and such cases of injury from tainted goods are comparatively rare; but because it is possible, through slight defects in the solder, or minute breaks in the cans, for such danger to result, the canners have been looking for a satisfactory substitute for tin. It is believed that this has at last been found in the paper pulp cans. They are oilproof as well as waterproof.

Recent investigations of the operations of the mind indicate that the subject under hypnotic influence is in a partial faint. The effort required to concentrate the attention on the operator or any striking object results in a reaction similar to that produced by strong emotion in "neurotic" women, except that the collapse is only partial, some of the faculties remaining active, while the operation of others is suspended. This hypothesis will account for some of the phenomena that are not accounted for by the theory that the hypnotized subject is in a condition resembling normal sleep.

Calcium Carbide, which is used to produce gas, is obtained by fusing together, in an electric furnace, quicklime and coal dust—two exceedingly cheap materials. The compound thus formed, on coming in contact with water, evolves a gas which readily burns. Steps have already been taken to produce the compound, calcium carbide, cheaply by utilizing the power at Niagara for furnishing the electric current, which is about 4000 to 5000 amperes for twelve hours. The illuminating power is considerably greater per cubic foot of gas than our present illuminants, and has been variously estimated at prices ranging from 7 to 75 cents per 1000 cubic feet.

Propelled by Electricity.

The electric-launch industry is slowly taking root in this country, the main difficulty being that of finding places at which to recharge the storage batteries, or get new supplies of chemicals if primary batteries are used. In this respect to-day the owner of an electric launch is often like a nation which has a fleet but no coaling station. In Europe the rivers are so much shorter than ours, the towns are so much closer together, and the population is so much denser that we find many places where launches are in demand and highly successful. The English Thames has a fine fleet, and the continental rivers are all dotted with such craft.

At Bergen, Norway, a regular line of electric-launch ferry has been established, with eight boats running on a five-minute schedule across the harbor. In winter, when the schedule is shortest, the boats ply from 7 A. M. to 9:30 P. M. On an average the boats cover thirty-seven miles daily and carry a total of 1800 passengers. The boats, which are twenty-five feet long, six feet eight inches beam, and made to carry eighteen passengers, are double-enders, with a screw at each end. A three-horse power motor runs each boat, and the chargiug station has a thirty-horse power dynamo. The service is efficient and popnlar. It would seem that there are places in America where such a plan could be adopted with advantage. Meantime electric launches are being put on many American artificial waters, and a fleet of six is being built for the Atlanta Exposition. One genius has fitted up a trolley line along a narrow stream, and the boats, instead of carryiug batteries, simply take current from a wire just as a trolley car does.

A new design of automatic marine fog signal has been fitted to the steamship "Duuera." The object of the apparatus is to give automatically, at the regular interval required by law in case of fog, the whistle or bell signals. On the bridge of the vessel is mounted a switch, by turning which the officer in charge can divert an electric current to either the whistle or the ship's bell, the latter, of course, being sounded if the ship is at anchor and the former when she is under way. The proper interval between the sounds is obtained by clockwork placed in the chart-house or some other convenient position. The current is generated by means of batteries, the clockwork completing the circuit at the necessary intervals, and in this way electrical energy is obtained for either striking the bell or opening the valve of the whistle. At the same time that the whistle is blown or the bell sounded a pen is brought into contact with a continuous band of paper, which is marked with divisions. As the paper is wound off at a uniform speed by the clockwork an autographic record is obtained showing when the fog signals, by bell or whistle, are sounded.

From the action of sulphuric acid on the gas of cleveite, M. Deslandres has obtained in the extreme red of the spectrum the third of the four lines in the solar spectrum that had not been found on the earth. This leaves only one permanent ray from the solar atmosphere, the green line, known as "the line of the crown," yet to be discovered in earthly substances; it probably belongs to some gas lighter than hydrogen.

Mechanical Progress.

Some Machine Shop Uses for Compressed Air.

On the erecting floors compressed air comes in for a good share of the work. Convenient cranes make it not only possible but much more satisfactory for one man to erect an engine, for instance, than if there are two or more men about it. Any piece of an ordinary-sized engine can be picked up and put in position by one man. In scraping the valve, for instance, the valve is lifted off its seat, after having been rubbed sufficiently to make its markings, and left suspended in the air while the seat is being scraped; then it is again let down for another rubbing, and so on until the job is completed.

Any one at all conversant with the work will readily appreciate what a convenient arrangement a crane of this kind can be made for this class of work. Here we come to the use of flexible shafts for drilling cylinders and drilling and tapping hubs of wheels, etc. A few years ago we used to consider that the flexible shaft was a very convenient thing for this purpose; and so it was, but its cost of maintenance, when used to produce work in large quantities, or, to be plain, when the use of the flexible shaft was changed from running it once or twice a day, at most, to constant and continual use, become considerable, and compressed air seems to come in as if made on purpose to fit the occasion.

Small engines can be run by air and made to drive drills and taps and a variety of tools far better and cheaper than by the use of the flexible shaft. There are other drills made for the use of compressed air direct without the intervention of the flexible shaft, and these answer the purpose admirably, though the small eugine plan has given the writer more satisfaction than the other.

Where electrical overhead cranes are used the air jet will be found very handy for keeping the armatures, and, in fact, the entire crane, clean. The dust can be blown off more effectively and hidden recesses can be better reached than by any manner of brushing or cleaning, no matter how carefully done.

When we reach the boiler shop the compressed air field widens materially. Indeed, it seems as if the different processes had been adapted or made to show the beauty of compressed air-driven machinery to the best advantage—punching, shearing, flanging, riveting, calking, fine-setting and beading. Each process can be better, neater and more economically accomplished by the use of compressed air than in the old way.—C. O. Heggem in Cassier's Magazine for August.

Paper Rims for Bicycles.

Paper rims will be put into bicycles next summer. First it was steel, then wood and now paper. Not tissue paper, to be sure, but paper nevertheless, and the change is to secure what seems uppermost in the minds of all the bicycle manufacturers just now—lightness of construction. And the substitution of paper for wood will not, it is claimed, sacrifice a particle of the strength of the wheel. On the contrary, the paper, after undergoing the process through which it is put, has all the strength and cuts off from one to one and a half pounds of the weight of each machine. Furthermore, it escapes the joint which is necessary in wooden rims and deprives them of some of their strength. Paper is used in the manufacture of car wheels. Why not in the manufacture of bicycle rims?

An Indiana man is the inventor of this new scheme, or of this application of the old scheme, and he is one of a company who are now establishing a factory at Laporte, Indiana, for the manufacture of wheels in which nothing but paper rims will be used. The process, as explained by one of that company, is this: Strips of ordinary express wrapping paper are put on a reel and allowed to pass slowly through a tank containing a solution which first soaks in, and when dry hardens and stiffens the paper. It takes about ten days for the solution to dry, but at the end of that time, it is claimed, a paper rim made in this way has all the strength, life and elasticity of a wooden rim. The weight is a good deal less in proportion than that of wood, and those who have experimented with the paper rims say they are destined to supplant the others. Some manufacturers have sacrificed a good deal in the way of strength to lightness. Perhaps here is a chance to lighten up the rims and add a little needed weight and strength elsewhere.

Damascus Steel.

It is stated that S. R. Dayson, of Des Moines, Iowa, is reported to have discovered a process for making steel equal in quality to the famous Damascus brand. In answer to an inquiry, Mr. Dawson writes the *American Manufacturer* as follows regarding the matter:

"With my process rolling is useless, as all manner of work can be cast direct from the crucible, ready to finish and temper as it comes from the molds, yet it does not require annealing, as it is nearly as soft as the wrought iron from which it is made. This metal cannot be injured by overheating. At the highest degree of hardness it will bend readily. It stands welding, forging and tempering far better than any high carbon steel. In fact my metal is not steel; it is really tempered wrought iron, as were the old Damascus blades. It is adapted to any purpose for which 'high tension' steel is now used. The principal feature of my process is chemical reaction, but I do not get the result by the introduction of carbon. As in the case of 'Russian iron,' analysis will not divulge my process."

Mechanical rock drilling at Danemora, Sweden, costs, according to the *Wormlandska Annaler*, 50 cents per yard, while hand drilling is only 25 cents, so that the only advantage of machine drilling would appear to consist in the greater depth to which the holes may be drilled. At Danemora the mean depth of holes with hand drilling is two feet four inches in stopes, and two feet in conversed steps or overhand stopes, while with machine drilling the depths are five feet, and three feet and three inches respectively. In the year 1890 with hand drilling a meter shot-hole brought down 2.17 tons of rock; but in 1892 with machine drilling, 4 tons, or 3.32 tons if the subdivision of the rock masses by hand drilling be taken into consideration. Doubling the depth of the hole therefore loosened nearly double the quantity of rock, or increased by more than 50 per cent the mass of subdivided rock. In Danemora hand drilling is paid for at the rate of 25 cents per meter, without taking into consideration a small charge for setting up the 1⅛-inch chisel.

An official of the Pennsylvania railroad says that the company pays $32 per ton, and that the rails used on that line average eighty-five pounds to the yard. When it has passed its useful stage the rail is replaced. The old rails that are taken out from time to time are gathered up every month and sold to junk and scrap dealers at $12 per ton, so that the company pays only $10 for the use of rails per ton. Rails that are not much worn are sold to factories along the road at $18 per ton, where they are used for sidings. There are many uses to which the old rail is put. A great amount of barb wire fencing is made of railroad iron, and very often the rails are used as foundations for large buildings. The Masonic Temple at Chicago, the loftiest structure there, has a foundation of old rails.

To such an extent has the coal-dust bricquette of Westphalia been made and sold that the yearly output of a syndicate engaged in that business is now over 800,000 tons.

Electrical Progress.

A Triumph in Telegraphy.

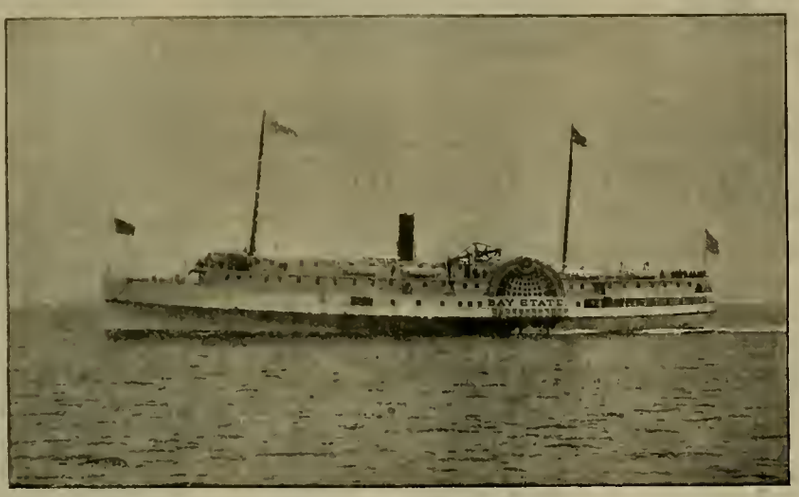
Western Union officials are elated over what they say is the success of a new invention in telegraphy. The experiments have been conducted in the private offices of the Western Union building in New York City upon the long circuit between New York and Chicago. The result of these experiments, as stated in the language of one of the officials of the Western Union Co., is this:

"We have secured the invention, which is the most advanced of anything that has been talked about in telegraphic service. We can send from New York to Chicago, in quadruplex over one wire, and have the copy produced at each end upon a printed page, and not upon a slip, 350 words a minute. I say we can do this because we have done it.

"There is no delay about it. It is not a system liable to be obstructed by delicate and impossible mechanism. It is not a fancy or a fad which can produce a result in an electrical laboratory, but be of no service in a practical operation of daily life. The invention is accomplished. It is practical. It will work. It is a practical printing telegraph which will give a result in page form like the page of a book. It is the thing that electrical inventers have been striving for since the day of telegraphy. It is the Wheatstone system very greatly modified and perfected, so that a single wire can be worked both ways and yield the result indicated. It will be some time before these machines can be put into practical operation, for a very few have as yet been made. They are still in the hands of inventors and constructors, but the scheme is perfected and the fact is accomplished."

It is understood that the Wheatstone device, which has been in use and has been owned by the Western Union Company for some years, has been greatly improved through the inventive and legal ability of a patent attorney named Buckingham, who is largely interested in the Western Union service.

The Western Union Company has made arrangements to use a newly patented typewriter machine, and an order has been given to equip the Western Union offices with this typewriter at about one-fifth the cost of the various typewriter machines, the prices of which are now regulated by a combination. Those who have given the subject attention predict that the time is not far distant when the typewriter, as well as the bicycle combination, will be broken, and when new machines, equal in the judgment of those who know them to those now on the market, will be furnished at so low a price as to be available to all. It is said that mechanical experts, who have recently investigated the cost of both typewriters and bicycles, report that the actual cost of these machines ought not to be much more than $20.



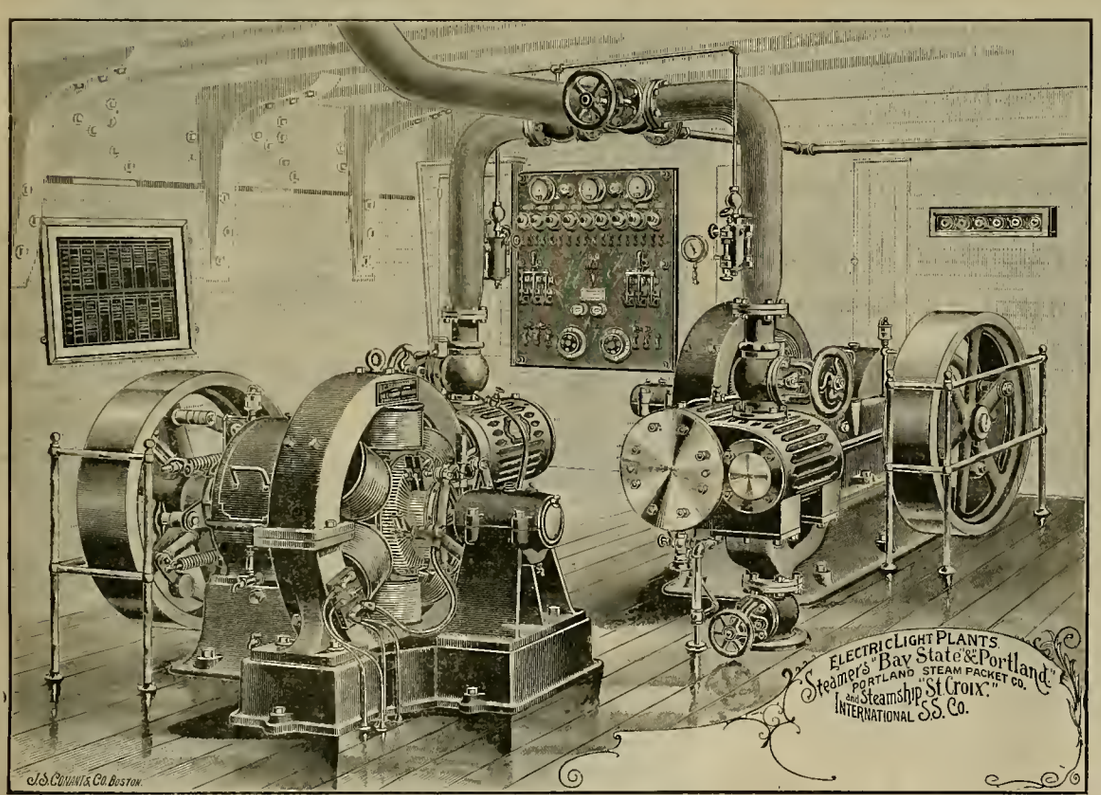
STEAMER "BAY STATE."

A COMPLETE REVOLUTION in the waterworks system of Chicago is prophesied. John P. Barrett is the discoverer of a new electrical system which, in the opinion of mechanical experts who have had opportunity to examine electrical water supply systems, will rank high in the scale of municipal utility.

Electric Light Plant on Steamer "Bay State."

Accompanying this is a cut illustrating the electric-light plant on the new steamer "Bay State," of the Portland & Boston line, recently installed by the Belknap Motor Company of Portland, Maine. The engines used are the "Ideal." The dynamos are multipolar, slow-speed machines of 400 lights capacity each, but either machine will carry the entire load which amounts to 540 lights. It has become a general practice to use duplicate plants for marine work, so in case an accident should happen to either engine or dynamo the duplicate machine can do the work. The dynamos were designed by Mr. W. H. Chapman, electrician for the company. This plant does great credit to the company, and has secured further orders for the installation of two direct coupled machines for the steamer "Portland" of the same line, also for the steamship "St. Croix" of the International Steamship Co., which is the bows of the boat. The fixtures are of the latest design with opalescent globes and shades. The dining saloon is fitted with ground glass globes, which give this part of the boat a very cheery and pleasing effect. The freight deck lights are protected with guarded fixtures.

The boat at night presents a brilliant spectacle, being a veritable floating palace and surpassing in all its appointments anything that can be found in Eastern waters, the Sound lines alone excepted. The addition of this boat has been the means of popularizing this line with the best class of the traveling public.



ELECTRIC LIGHT PLANT, STEAMER "BAY STATE."

Practical Information.

The Most Precious Metals.

We commonly think of gold as the most valuable of metals, because it is the most precious of the metals that are produced in sufficient quantity to be in common use. There are, however, several rare metals that are much more valuable than gold. Gallium, for example, is quoted at $3000 an ounce avoirdupois. Traces of it occur in some zinc ores, tons of which must be worked over in order to obtain a trifling amount. Gallium is a very remarkable substance. At an ordinary summer temperature of 86° F., it becomes like liquid mercury. The latter becomes solid at 39° below zero. Most costly of all metals, save only gallium, is germanium, which is quoted at $1125 per ounce. Rhodium is worth $112.50 per ounce; ruthenium, $90 an ounce; osmium, $26 an ounce, and palladium, $24 an ounce. The last is about equal in value to gold. These metals are of no great commercial importance. Most of them are mere curiosities of the laboratory, having been discovered originally by accident, incidental to the analysis of ores. It has been suggested that some of them might be coined, but the supply of them is too uncertain. That was the difficulty with platinum, which the Russian Government minted in the first half of the present century. Iridium is utilized to some extent for making instruments of delicacy which must have the property of not corroding. It is obtained from "iridosmin," a natural alloy of iridium, osmium, rhodium, platinum and ruthenium. This extraordinary mixture of rare metals is white.

The Dominion Parliament has voted a bonus of $80,000 per annum for twenty years to the first section of the road to Hudson bay, payments of $40,000 per annum to begin when half the section is finished, and $40,000 more when the whole is completed. This will enable the promoters to carry the road as far as the Saskatchewan river, and they assert that when they get there it will be easy to secure a considerably larger bonus for the section beyond. It is doubtful, however, if Hudson bay will ever be reached by rail, and still more doubtful if the ocean route from there to Liverpool will ever be traversed by ocean steamships.

SOLDERING "uphill," as in the case of joining a pipe while in a horizontal position, is brought about by cutting away the upper half for about six inches or more in length and working on the inside with the soldering iron till the lower portions are united, and then finish from the outside by soldering in the piece removed. This brings a whole circle within the reach of handling solder on an arc of ninety degrees.

NAVAL OFFICERS who have recently examined specimens of aluminum, which have been submitted to tests in salt water, say that the metal will not be available for use in the construction of naval vessels, because after being in salt water for a time it crumbles to pieces.

IT IS SAID that an ingenious clock has been made in Scotland that stops short at midnight every Saturday, suspends time-keeping for twenty-four hours, and then resumes.

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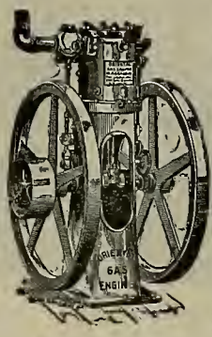
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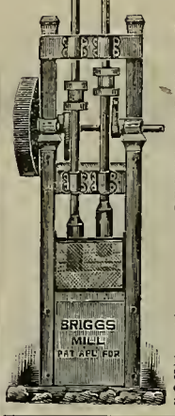
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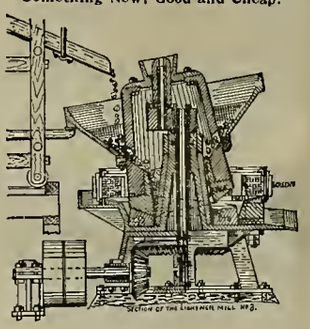
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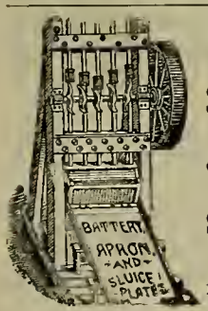
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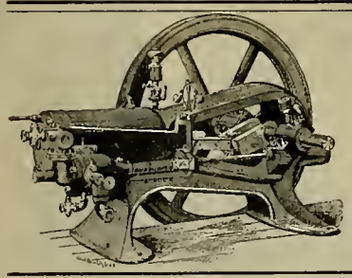
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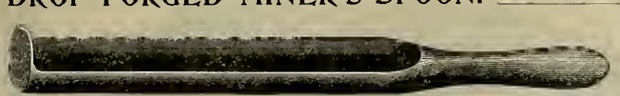
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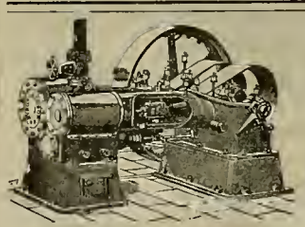
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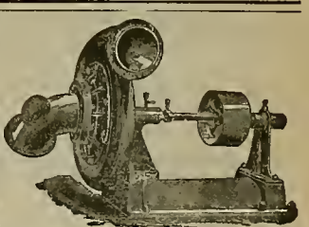
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	DALLAS, TEXAS.		



WRITE FOR CATALOGUE NO. 15.



Jackson's

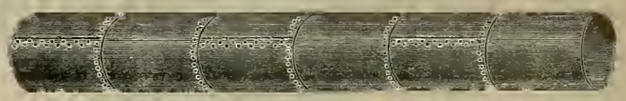
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FOR EVERY DUTY AND CAPACITY.

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STEEL OR IRON.—We make pipe of either, but recommend STEEL, it being superior to iron in many particulars and inferior in none.

COATING.—We use great care in COATING our pipe with a HOT solution of Double Refined Asphaltum and Maltha.

COMPETITORS.—Our competitors say we have the best appointed Pipe Shop on the Coast.

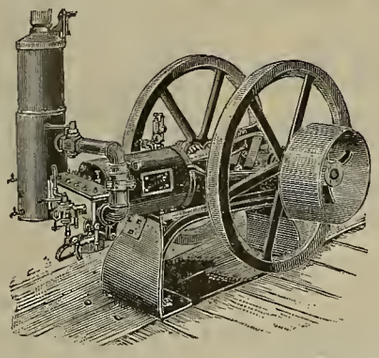
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UP TO DATE!

SAVE MONEY



BY USING

THE "DANIEL BEST" CRUDE OIL ENGINE FOR POWER.

THIS IS WHAT THEY CAN DO:

Will furnish power for one-tenth of a cent per horse power per hour. It is the cheapest power ever produced, as shown in the following table, and which is based upon a test of ten hours' run with one of our five-horse power Gasoline Engines, using gasoline (74°), coal gas, common domestic coal oil, crude petroleum, asphaltum base, crude petroleum, paraffine base, as follows:

Coal Gas, ten hours' run. 1000 feet	$2 00
Gasoline (74 deg.), ten hours' run. 8¾ gallons @ 14c	1 25
Coal Oil. ten hours' run. 7½ gallons @ 10c	75
Crude Petroleum, asphaltum base, 16 gallons @ 3c	48
Crude Petroleum (36 deg.), paraffine base, 13 gallons @ 5c	65

On the crude petroleum with asphaltum base we had an over-product of 7 gallons of asphaltum; the market price is 3 cents per gallon=21 cents. This deducted from the first cost of the crude petroleum for ten hours' run leaves a net balance of 27 cents. And from the crude oil with a paraffine base we had an over-product of 3 gallons of good lubricating oil, which we consider equal to any we have ever used, but will estimate its value conservatively at 20 cents per gallon, making 60 cents; this deducted from the first cost of the crude oil leaves a balance of 5 cents, total cost of running ten hours.

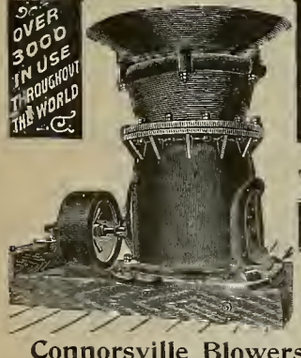
It will be readily seen that the operation of these Engines with crude petroleum reduces the cost of operation to a minimum. Crude petroleum with paraffine base at 1-10c per horse power per hour; on crude petroleum, asphaltum base, ¼c per horse power per hour; on domestic coal oil, 1½c per horse power per hour; and on gasoline, 2½c per horse power per hour.

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GATES ROCK AND ORE BREAKER



PRODUCES A MORE PERFECT CUBIFORM MATERIAL AND A GREATER QUANTITY IN A GIVEN TIME PER HORSE POWER USED THAN ANY OTHER CRUSHER ON EARTH.

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GENERAL MINING MACHINERY

OF EVERY DESCRIPTION.

TREMAIN STEAM STAMPS

Connorsville Blowers, King-Darragh Concentrators, Stamps, Hoists, Rolls, Pans, Settlers, Smelters, Metallurgical Appliances, Etc.

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Represents the highest development yet attained in water wheel practice and affords the most simple, efficient and economical means of utilizing water for power purposes.

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Aggregating over 400,000 horse power. Adaptation made to all conditions and every variety of service.

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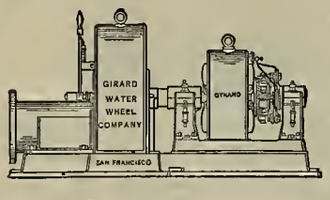
PELTON WHEELS are the recognized standard for electrical work and are running a majority of the stations of this character in all parts of the world.

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IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.

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CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.



STAMP SHOES.



STAMP DIES

These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

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Special attention given to the purchase of Mine and Mill Supplies.



Stamp Cam.

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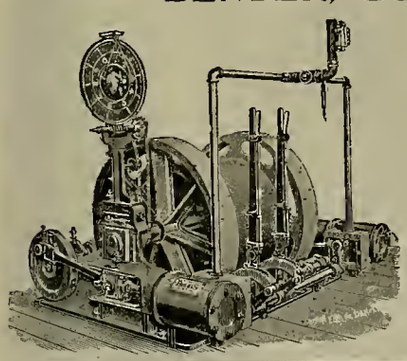
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TWENTY-SEVEN YEARS' CONTINUOUS SERVICE in the great Mines, Steamships, Railroads and Mills all over the world prove it to be

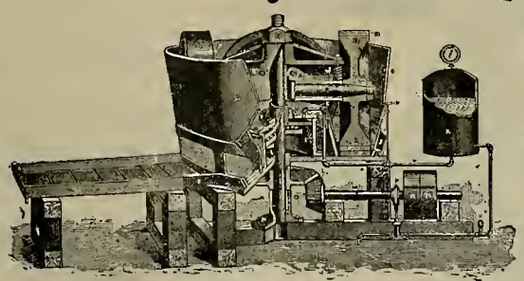
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Superior to any other Wet Mill now in existence.

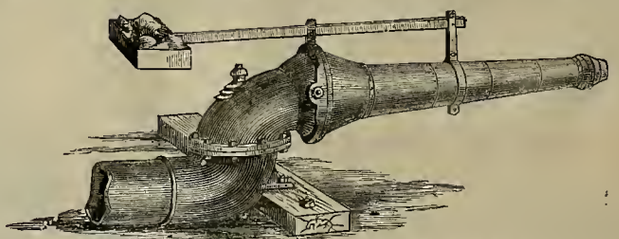
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That will pay for itself in a short time by its very high percentage of gold saving.

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The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 42 Fremont St., San Francisco.

Market Reports.

The Markets.

SAN FRANCISCO, Aug. 22, 1895.

The upward tendency in all metals continues, copper being the most noticeable. Jas. Lewis & Son, of Liverpool, England, say of copper: "Values with us are still considerably below those ruling in New York, and shipments from hence to the United States may soon be made. We are advised that the consumption in the United States is quite phenomenal at present. Shipments to Europe for the next two months are expected to be very small and confined to sales made some time ago, efforts to cancel some of these sales being made. Should this prove to be the case, a further considerable advance in values on this side appears almost certain. For English refined copper there has been an active demand, and nearly all producers are well sold forward, many of them having now withdrawn from the market. Consumers' stocks are believed to be exceptionally small."

The production of copper in the United States during June was 12,741 tons, a decrease of 2119 tons compared with the previous month. The U. S. Geological Survey reports the production of copper from American ores for the calendar year 1894 at 360,844,218 pounds. The report states that there were no notable discoveries of new deposits the past year, and no indications of a sudden addition of consequence to producing capacities.

New York Metal Market.

NEW YORK, Aug. 22.—PIG IRON—Southern, 11@14c; Northern, 12@14c.

COPPER—Brokers', 11.80@11.90c; exchange, 12.20@12.25c.

LEAD—Brokers', $3.37½; exchange, $3.60.

TIN—Straits, 14.60@14.65c.

SPELTER—Domestic, $4.20.

New York Silver Prices.

NEW YORK, Aug. 22.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30⅝	66½	11 80	.....
Saturday	30½	66¼	11 85	3 37½
Monday	30½	66⅜	.....	3 37½
Tuesday	30⅜	66¾	.....	.....
Wednesday	30⅜	66¾	11 95	3 40
Thursday	30⅜	66¾	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lendcr	6@8
New York Sigbt Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.89½
London Merchants	$4.87½
London Sight Bankers	$4.90¾
Refined Silver, per ounce	66¾c
Mexican Dollars, nominal	54c

San Francisco Metal Market.

COPPER.

Bolt	¼ & 5-16, 17c; ⅜ and larger, 17c		
Lake Superior Sheathing	19	@	—
Ingot, jobbing	—	@	15
Ingot, wholesale	14	@	13
Sheet copper	—	@	18

ZINC.

Sheet	9	@	

LEAD.

Pig	—	@	4 00
Bar	—	@	4 10
Sheet	—	@	5 35
Pipe	—	@	4 85

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "	"	...	1 45
Buck, Balls and Chilled, do, "	"	...	1 45

IRON.

American Soft	15 00	@	17 00
Pig, per ton	16 00	@	19 00

STEEL.

English, lb	15	@	17

ANTIMONY.

Per lb	—	@	10

PIG TIN.

Per lb	15	@	16 00

QUICKSILVER.

Home trade, per flask	41 00	@	— —

TIN PLATE.

Per bx	5 25	@	6 00

ZINC.

Sheet	8¼	@	

BORAX.

Refined, in car lots	—	@	5¼
Refined, in sacks and barrels	—	@	5⅝
Powdered, in car lots	—	@	5⅝
Concentrated, "	—	@	4⅞

COAL.

SPOT FROM YARD—PER TON.

Wellington			$ 8 00
Greta			7 00
Nanaimo			6 50
Gilman			6 00
Seattle			6 50
Coos Bay			5 00
Cannel			8 00
Egg, hard			12 50
Wallsend			7 00
Scotch Splint			7 50
Brymbo			7 50

TO ARRIVE—CARGO LOTS.

Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

COKE.

Gas Companies'	75c	@	$ bbl 10 00
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —

NAILS.

Wire			$2 30
Cut			2 00

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, August 22, 1895.

There was a drop in prices during the week, with a slight rally yesterday, the Gold Hill stocks showing the most strength.

The San Francisco Stock Exchange voted down a resolution to allow the public access to the floors between 11:30 A. M and 12 M. and 3:30 and 4 P. M. These are matters that regulate themselves. A rule long in disuse has been recently enforced prohibiting dealers outside the railing from buying and selling stocks on their own account without first consulting a broker.

The directors of the Ophir have appointed Messrs. Lyman and Messer a committee to examine and report upon the advisability of buying the Concordia Mining property on the Brunswick lode.

The Con. California and Virginia is about to resume work on the 1000 and 1100-foot levels, north of the old shaft. The Morgan mill will soon resume crushing ore.

The following illustrates the changes of the week:

Mines.	Aug. 15	Aug. 22
Alpha	.....	.....
Alta Consolidated	.....	$ 10
Andes	$ 31	28
Belcher	31	60
Best & Belcher	1 25	1 10
Bodie	12	10
Bullion	21	.....
Challenge	.....	40
Chollar	62	59
Confidence	.....	1 20
Consolidated California and Virginia	2 95	2 75
Consolidated New York	.....	.....
Crown Point	43	55
Exchequer	02	.....
Gould & Curry	65	56
Hale & Norcross	1 90	1 80
Justice	.....	07
Mexican	74	68
Ophir	1 70	1 55
Overman	.....	19
Potosi	65	58
Savage	41	36
Sierra Nevada	.....	42
Union	53	48
Utah	.....	.....
Yellow Jacket	41	39

San Francisco Stock Board Sales.

SAN FRANCISCO, August 22, 1895.

9:30 A. M. SESSION.

300 Andes	28	250 H & N	1 80
700 Belcher	60	200 Justice	07
200 Best & Belcher	1 05	500 Kentuck	02
300	1 10	250 Mexican	68
400 Challenge	40	200 Occidental	31
200 Chollar	58	200 Potosi	58
50 Confidence	1 20	200 S B & M	10
100 Crown Point	55	150 Sierra Nevada	42
100	54	50	41
200 Con. Imperial	01	100 Union	47
150 C. C. & Va	2 75	200	48
100 Gould & Curry	56	300 Yellow Jacket	39
400	55		

SECOND SESSION—2:30 P. M.

250 Alta	10	300 Crown Point	53
250 Andes	28	50	52
100 Belcher	59	100 G. & C	54
600 Best & Belcher	1 05	200	53
650 Bodie	10	200 Mexican	67
200 Caledonia	13	700 Occidental	30
100 Challenge	38	200 Ophir	1 55
100 Chollar	58	100 Overman	19
200	59	200 Savage	36
250 Con Cal & Va	2 70	350 Sierra Nevada	41
50 Confidence	1 15	200 Union	48
100 Hale & Norcross	1 80		

THE belief that the shallower parts of the bottom of the eastern Atlantic are parts of a submerged continent once joined to the American mainland seems to be growing. A writer in the *Westminster Review* says that the scientific evidence in support of Plato's story of a lost Atlantis has recently multiplied a hundredfold.

THE great coal strike in western Pennsylvania has been averted. The miners have secured a slight advance of wages to date from October 1. The operators had intended to postpone any readjustment until November 1.

OWING to the settlement of the trouble in Pennsylvania the outlook in the West Virginia, Ohio, Indiana and Illiuois mining regions is more peaceful. The Michigan iron miners are still out, however.

Compressed Air Transmission Six and One-half Miles Long.

TO THE EDITOR:—The Fulton Engineering and Shipbuilding Works, of this city, are extremely busy with a number of important contracts involving the use of compressed air, which should be interesting to mine owners.

Contracts have just been signed for a compressed air transmission six and one-half miles long, from Towles Station, on the line of the C. P. R. R., to the Pioneer mine, in Humbug canyon, which Mr. Fair and Mr. Davis have recently sold to a syndicate of Boston capitalists. The air will be compressed in a duplex tandem compound Rix air compressor, by means of a 14-foot Pelton water wheel, directly on the compressor shaft. The initial pressure will be about 100 pounds. The air will then be carried through iron tubing six and one-half miles to the Pioneer mill, where it will pass into a reheater and be heated to 350 degrees. From this reheater it will pass into a pneumatic motor, Corliss type, of about 100 H. P., to run the mill, and also be carried about 1000 feet away to operate a system of rock-breakers, and also carried into the mine to operate eight or ten rock drills.

The tubing will be laid capable of carrying 450 H. P., the initial plant being for 225 H. P. It is expected that the I. H. P. in the air compressors will be realized in the motors, or very nearly so, which would make the efficiency of the transmission about ninety per cent, not taking into consideration the fuel used to reheat the air.

This plant will afford an opportunity for a direct comparison with electrical transmissions, both as to economy and general utility for general mining purposes.

A contract has also recently been signed with the North Star Co., of Grass Valley, for a Rix compound direct-acting pneumatic hoist of the Corliss type.

This same company has also contracted with the Dow Pump Works, of this city, for a compound pneumatic sinking pump.

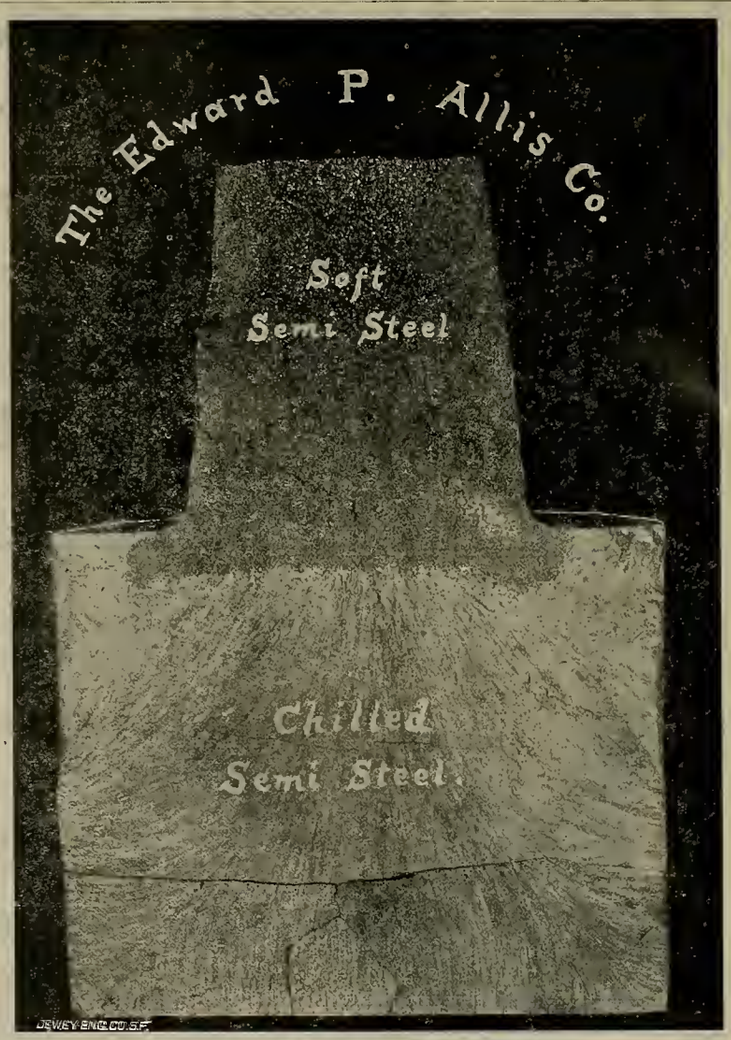
It is interesting to note in this connection that this mine will now possess a complete outfit of the very highest class of pneumatic machinery. It is very seldom that a builder has an opportunity to finish up a plant in so complete a manner with entirely new and modern machines. In the first place, the head of water is 750 feet, brought to the water wheel in a large pipe, which furnishes an economical water supply. The water is impinged against a Pelton water wheel 18 feet 6 inches in diameter, constructed especially for this compressor, and is situated on its main shaft, thus avoiding all losses by transmission gearing. The compressor is a duplex tandem compound of 200 H. P., with intercoolers located in the wheel pit, where the temperature of the air will be reduced to that of the water. The air is conducted through a large pipe to the mine, which is not over 1500 feet distant. It is there heated to 350 degrees before entering either the hoisting engines or the compound sinking pump. In the hoisting engines, after passing the initial cylinder, it is taken back to the reheater at a pressure of about 25 pounds, and heated again before it is used in the compound cylinder from which it is exhausted at one pound and a half pressure. The expansion is therefore almost complete.

The hoisting engines will be of modern pattern and very economical. It is calculated that the economy of this transmission will not be less than ninety-five per cent, without taking into consideration the fuel for reheating the air. In other words, the 200 I. H. P. in the air compressor cyliuders will be developed fully in the motors at the mine.

This plant will be a typical compressed air plant, and if the anticipations of its builders are realized will materially encourage people in the use of compressed air for similar purposes.

E. A. RIX.

San Francisco, August 21, '95.



"Semi-Steel" Shoes and Dies.

The cut represented is a cross-section view of a "semi-steel" stamp shoe, after having been broken with a powerful trip hammer. The Edw. P. Allis Co., of Milwaukee, have lately added this production to their large list of miuing machinery, and, having been thoroughly tested in this and other States, the makers believe they have a shoe and die it will pay miners and millmen to investigate.

The ideal stamp shoe is one having a hard, durable, flawless and penetrating chilled wearing surface, and a soft, tough-texture, non-breakable neck. Such a shoe will give the greatest amount of wear and still be free of any tendency to fracture. Through long experience in the casting of chilled iron and steel for other purposes the manufacturers have become expert in castings of this description.

The "semi-steel" shoes and dies are made under a patented process and have all the properties of the ideal shoe and die, and are considered equal, if not superior, to any manufactured, at the same time much lower in price. Orders are solicited for a trial lot, and the makers feel confident of demonstrating their claims. Address all communications to the Edw. P. Allis Co. branch office, 9 Fremont St., San Francisco.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Belcher S M Co., Nev	51	25c	July 16, Aug 20, Sept 10	C L Perkins, Mills Building
Bodie Con M Co, Cal	18	15c	Aug 13, Sep 16, Oct 7	M E Willis, 309 Montgomery
Con Imperial, Nev	36	1c	Aug 5, Sept 12, Oct 3	C L McCoy, Mills Building
Evening Star M Co, Cal	19	1c	Aug 5, Sept 10, Sept 22	J J Scoville, 320 Sansome
Gould & Curry, Nev	76	15c	July 2, Aug 6, Aug 28	A K Durbrow, 309 Montgomery
Kentuck Con, Nev	11	10c	Aug 6, Sept 10, Oct 1	Aug Waterman, 309 Montgomery
Mono M Co, Cal	35	10c	July 16, Aug 15, Sept 10	M E Willis, 309 Montgomery
Ophir S M Co, Nev	66	25c	July 11, Aug 13, Sept 2	E B Holmes, 309 Montgomery
Potosi M Co, Nev	44	25c	July 14, Aug 14, Sept 4	C E Elliott, 309 Montgomery
Sierra Nevada S M Co, Nev	109	25c	July 30, Aug 30, Sept 23	E L Parker, 309 Montgomery

List of U. S. Patents for Pacific Coast inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUGUST 13, 1895.

544,525.—PAPER CAN—G. H. Bartlett, S. F.

541,125.—FLOOD GATE—Bruce & Van Buskirk, Lodi, Cal.

544,349.—SHOELACE FASTENER—Kate Burgin, S. F.

541,131.—BERRY PACKAGE—S. W. Funk, Glendora, Cal.

541,111.—HAND DRILL.—H. D. Laufair, Westminster, Cal.

541,313.—HINGE—R. G. McClellan, S. F.

541,586.—TOILET-PAPER HOLDER—W. L. Pattalna, Alameda, Cal.

541,517.—GUNPOWDER—W. C. Peyton, Santa Cruz, Cal.

541,508.—CAR COUPLING—Sparks & Collins, Mt. Vernon, Wash.

541,521.—BICYCLE NAME PLATE—C. W. Vosmer, Oakland, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

LANTERN.—Emil H. Kennedy, Oakland, Cal., and Wm. Mathews, of Alameda, Cal., said Mathews assignor to said Kennedy. No. 543,691. Dated July 30, 1895. This invention relates to that class of lanterns in which an ordinary lamp chimney is adapted to be readily lifted to and removed from a candlestick base. The lantern is composed of a base; a chimney resting on said base; a swinging frame exterior to the chimney and having a top bar passing over the chimney top and spring sides; a bail or handle connected with said frame, whereby it is manipulated; and a spring under the base having projecting ends with eyes, with which the ends of the spring sides of the frame removably engage, whereby the frame may be readily detached from the base. There is thus provided a simple, cheap and effective lantern, adapted to be easily lighted and extinguished, and the base of which may at any time be disconnected and used as an ordinary candlestick.

HAIR CLIPPER.—F. Baugerter, San Francisco, Cal., assignor to Chas. H. Green, same place. No. 543,668. Dated July 30, 1895. The object of this invention is to provide a hair-clipping machine having a hinge connection between the cutter head and the handles, and a mechanism whereby the cutter may be actuated from the handles in whatever position it may stand with relation to them. It consists of a stationary comb plate having upwardly extending standards; a movable cutter plate having a recessed rear end, with outwardly extending arms; a cap plate, the front edge of which curves downwardly to rest upon the movable plate; a pair of pivoted handles, each having extensions below its pivotal connection, one of said extensions being pivotally mounted upon a horizontal axis between the standards from the stationary plate, and the other located between the rear extending arms of the movable plate, said arms being curved so that the handle extension will always be in position between them in whatever position the parts may stand with relation to each other.

GAME APPARATUS.—John Q. Brown Jr., San Francisco, Cal. No. 543,722. Dated July 30, 1895. This invention is a device or game representing a trial in court. It consists of a board or chart subdivided into a number of series, comprising each a number of sections, each numbered from first to last, and other unnumbered sections marked upon the board in suitable relation with the series in combination with cards marked and designated to correspond with the different series and sections.

DEVICE FOR HANDLING HEAVY PROJECTILES.—Theodore Forssell, Vallejo, Cal. No. 543,728. Dated July 30, 1895. This invention relates to a device for handling projectiles and ammunition, especially adapted to be used in connection with the heavy ordnance on board vessels and in other places. It consists of a two-part metal band adapted to clasp the projectile, said band having the free end of its sections slotted, the free end of one section adapted to receive the corresponding end of the other section to bring the slots into coincidence; a rigid supplemental eye; a key passing through said slots to unite the free ends, and a hoisting device adapted to engage the supplemental eye to suspend and transport the projectile.

ADVERTISING CASTOR.—C. E. Larrabee, Berkeley, Cal. No. 543,938. Dated Aug. 6, 1895. This invention relates to table castors, and it consists of a base for the reception of the castor bottles, an upright frame rising from said base having the upper portion so constructed as to hold and display advertising cards or sheets, the frame being surmounted by a shelf upon which to place napkins, and having disposed upon it convenient receptacles for containing articles, such as toothpicks.

LUBRICATOR.—James Janda, Korbel, Cal. No. 544,040. Dated Aug. 6, 1895. This invention relates to lubricators such as are adapted for the oiling of moving bearings like cranks, in which a suitable wiper in communication or connection with the bearing or journal is mounted upon the connecting rod or moving part and is adapted as it moves past the outlet of a drip cup to wipe off or receive the drop of oil therefrom and convey it to the part to be oiled. It consists of a cup or vessel secured to the moving part, having a tube or pipe in communication with the bearing or journal to be oiled, said cup or vessel having an open top and containing absorbent material leading to the bearing or journal and adapted to be reached by the discharge tube of the drip cup whenever it passes said tube, so that oil will be taken from the drip cup by the absorbent material and gradually conveyed to the part to be lubricated.

VOTING MACHINE.—S. Ducas, San Francisco, Cal. No. 544,218. Dated Aug. 6, 1895. This invention relates to a machine by which votes may be cast and registered. It consists of a table or surface containing the names of the candidates to be voted for, movable spindles corresponding with each of the names and capable of being depressed by the voter, punches attached to each of the spindles and movable therewith, a roll or sheet coiled upon a drum having the names or numbers of all the candidates written at one side and corresponding in position with the respective spindles, and names which are indicated upon the table so that the depression of any spindle will actuate the punch and perforate the sheet at a point corresponding with the name of the candidate to which the spindle is appropriated. In conjunction with this is a mechanism consisting of ratchet wheels with advancing and holding pawls, stop pins fixed to the ratchet wheels adapted to arrest their movement when the full number of candidates for any office have been voted for and connecting devices so disposed with relation to the spindles that they will be actuated by the depression of any of the spindles corresponding to the number of candidates for that office, and a mechanism connected with these devices and with the advancing pawls of the ratchet wheels whereby the latter will be rotated and advanced a tooth for the depression of each spindle until the full number have been voted, and the arresting stop prevents further movement of the ratchet wheel.

Sampling Works for Sale.

The works are situated at Daggett, Cal., in the Calico Mining District, and on side track of the Atlantic & Pacific Railroad. They contain a first-class 50-horse power Engine and 45-horse power Boiler, with Ore-crusher and other machinery, Mill Scales, Assaying Outfit, etc., all nearly new. Also upon the premises an office building and a comfortable dwelling house (portable). The above can be had at a bargain. Apply to JOHN H. GILLESPY, 1906 Stockton St., San Francisco.

Assessment Notices.

KENTUCK CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the sixth day of August, 1895, an assessment (No. 11) of Ten (10c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room No. 23, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the tenth day of September, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the first day of October, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

AUG WATERMAN, Secretary.

Office—Room No. 23, Nevada block, No. 309 Montgomery street, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from W. A. and M. E. Schofield, in the King Sayre Mine, near Gibsonville, Sierra Co., to impound tailings in Whiskey Creek; from N. B. Willlis and B Pride, in the Willow Placer Mine, near Sierra City, Sierra Co., to impound tailings on flat ground; from Oliver F. Cayn and W. T. Sherman, in the Canada Mine, near Port Wine, Sierra Co., to impound tailings in French Ravine, from H. H. and A. A. Moyer and John Costa, in the Argentine Mine, near Downieville, Sierra Co., to impound tailings in a dry ravine; and from John Pascoe, in the Eureka Hydraulic Mine, near Placerville, El Dorado Co., to impound tailings in Chili Ravine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Sept. 2d, 1895, at 1:30 P. M.

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DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 25) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald, Trustee	295	1,000	100 00
M. J. McDonald, Trustee	296	1,000	100 00
M. J. McDonald, Trustee	298	1,000	100 00
M. J. McDonald	455	250	25 00
M. J. McDonald, Trustee	454	2,827	282 30
Paul Lotz, Trustee	297	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
Mrs. Hattie C. Baggs	529	201	20 10
G. W. Luce, Trustee	582	317	31 70
Alex. McLaughlin	392	200	20 00
Alex. McLaughlin, Trustee	393	125	12 50
Alex. McLaughlin, Trustee	414	200	20 00
S. H. Barnes, Trustee	280	500	50 00
S. H. Barnes, Trustee	353	154	15 40
Geo. Dillman	550	980	98 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
Israel Luce, Trustee	395	1,000	100 00
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	482	1,250	125 00
W. W. Sargeant, Trustee	485	1,000	100 00
W. W. Sargeant, Trustee	488	745	74 50
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	516	600	60 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
Jos. Rosenthal	489	5	50
Percy Beamish, Trustee	494	500	50 00
Percy Beamish, Trustee	495	225	22 50
H. H. Noble, Trustee	523	4,000	400 00
Montgomery Baggs	528	100	10 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

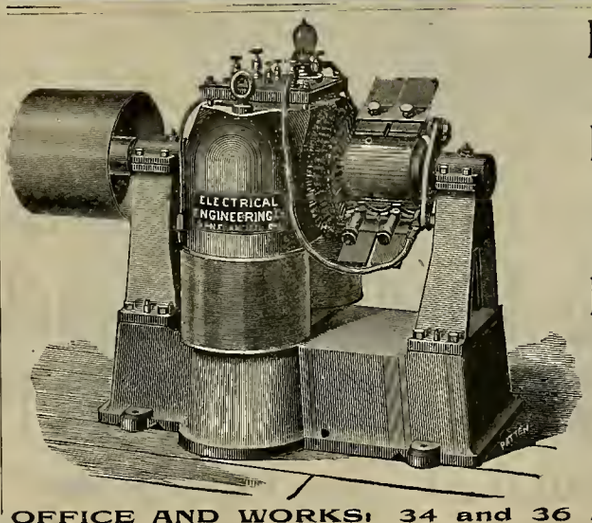
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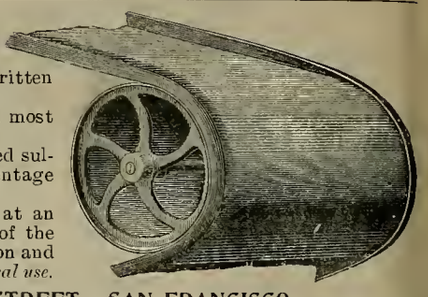
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We are now having our belts made by the best rubber manufacturers in New York and Boston, under written guarantees both as to quality and mechanical construction.

We have been granted two United States patents for improved devices in concentrating belts, the first and most important of which is for a slight riffling of the surface at intervals and crosswise of the face of the belt.

While these riffles are only about one-thirty-second of an inch in depth, they are very effective in saving floured sulphurets and reclaiming quicksilver and amalgam that may escape from the plates, thus gaining a large percentage of values that would go off with the tailings from belts with entirely smooth surfaces.

Our second patent is for an improvement in the flanges which practical mill men will appreciate. They stand at an acute angle inwardly, therefore they thoroughly confine the pulp on the belt; and in passing over the end pulleys of the machine, lie partly down, consequently do not crack or break, as do the old-style flanges; thereby much vexation and loss is avoided. *We keep in San Francisco and New York belts of all lengths and widths suitable for all concentrators in general use.*

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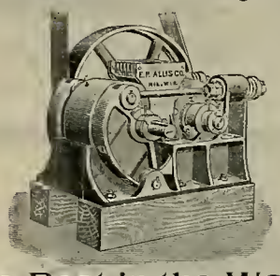
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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 9.

SAN FRANCISCO, SATURDAY, AUGUST 31, 1895.

THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Girard Water Motor and Dynamo.

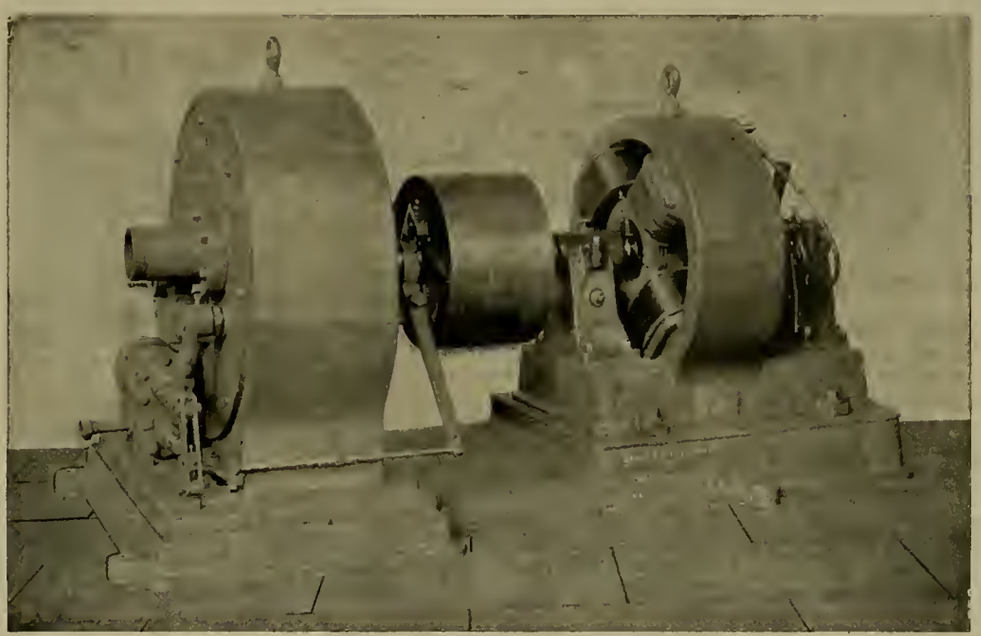
The Girard Water Wheel Co., in conjunction with the electrical Engineering Co., recently completed and shipped to the North Star mine, at Grass Valley, Cal., the water motor and dynamo shown in the illustration. The machines are direct connected and mounted on the same bed plate, making a complete and compact plant for electric lighting.

The water motor is 16½ inches in diameter, with simple contracting nozzle of sufficient size to develop the power required by a 100-light dynamo. The head is 750 feet and the speed 1400 revolutions per minute.

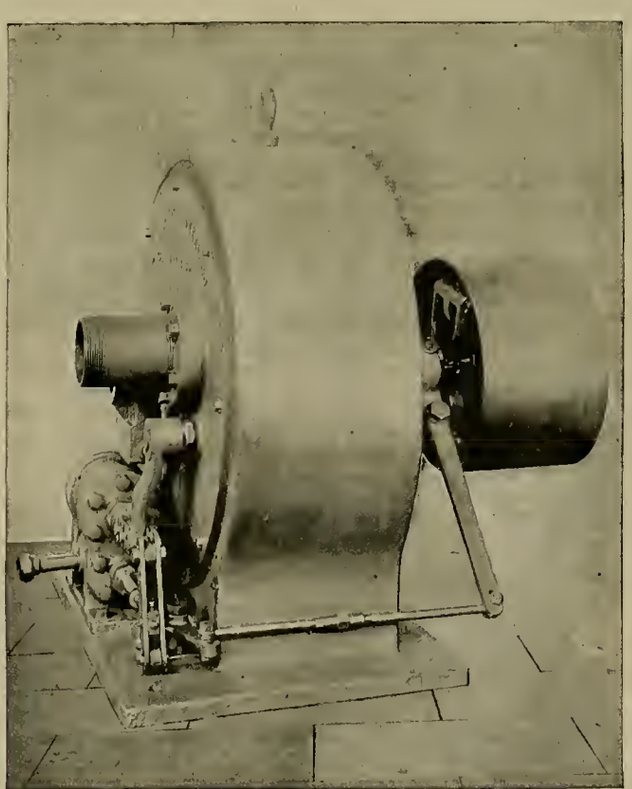
The S. & V. inertia governor is partially shown inside of the pulley which acts as a covering for it. The indications of the governor are transferred through levers to the balanced valve, which controls the admission of water to the hydraulic cylinder operating the nozzle. The construction of the governor is such that there can be no variation between the work of the dynamo and the power on the motor without a change in the cylinder, and the connections are so close and the movements so rapid that the nozzle area is altered immediately after the change takes place and before the inertia of the moving parts allows the speed to vary.

The water to supply the cylinder is taken from the upper side of the gate, and is passed through a self-cleaning strainer to remove obstructions.

The dynamo is of the multi-polar type, *D*, with large self-oiling bearings, which is the type the Electrical Engineering Company has been making for the past six or eight months.



GIRARD WATER MOTOR AND DYNAMO, DIRECT CONNECTED.



GIRARD WATER MOTOR 16½ INCHES IN DIAMETER.

Sacramento sends invitation to attend the electrical display in the State capital city on the 9th of next month, when will be fittingly celebrated the successful Folsom electrical power transmission on the 45th anniversary of California's statehood. 'Tis such events that indicate the world's progress. The telegraph and steam engine have almost annihilated time and space; California fresh fruit is eaten in London; Oregon salmon is on store shelves in South Africa, and Washington fir in the Johannesburg mines; the big world has shrank, and the Antipodes are 'round-the-corner neighbors. And now in these sunset years of the century is being discovered how needless the fear of coal mines being exhausted in the new utilization of electricity, thus one step nearer the primal source of all power—the sun. With coal the stored up sunshine of primitive ages is set free; with electric transmission the water that the sun lifted generates by gravity force as it seeks its original level—one step nearer to the ultimate result when discarding the demonstration of power by means of long buried sunlight, or by the force of returning water flow the great central day star itself will be made the primal direct source of motion and power. These are rushing times, and a generation that can harness Niagara and transmit power in the manner shown at Sacramento has much to be industrially proud of, but science points onward to where greater achievements will be to even present advancement as the first herald of day dawn is to the splendor of noon.

On the 18th of last April, in the case of W. J. Sweeney, in the Helena, Montana, land office, who there applied for U. S. patents to seven contiguous lode claims, the application was rejected by Hoke Smith, Secretary of the Interior, who wrote the Helena land office that "the total amount returned by the Surveyor as the value of the improvements is but $3305, whereas for the seven claims it should be the full amount of $3500." The application was rejected. The U. S. Surveyor-General of Utah issued a circular to his deputy mineral surveyors that improvements or work to the amount of $500 must be certified to in the application for a patent to any mining claim, whether consolidated or separate. A question having been raised, he wrote to the General Land Office on the 1st inst., asking whether such construction was correct. On the 13th E. F. Best, acting commissioner, replied to the Utah Survey-General's inquiry, telling him that the circular he had issued to his deputy mineral surveyors should be recalled, and says "the proof should show an expenditure of $500 on each claim, except it be shown that $500 worth of improvements on any of such claims is for the common benefit of all."

H. S. Durden, secretary of the Board of Trustees of the State Mining Bureau, recently wrote to the State Attorney-General regarding collection of taxes for the maintenance of the State Mining Bureau, directing attention to the act creating the Mining Bureau and providing for its maintenance. The Attorney-General replies that in his opinion the law is still in force and effect, and should be complied with by the tax collectors of the various counties, and suggests that the Trustees of the Bureau notify the tax collectors that the law is still in force.

The offer of the Union Iron Works to furnish sixty men to speed the Olympia across the Pacific was not accepted by the navy department and that swift vessel will make the trip to Japan at the ordinary moderate pace usual to vessels of the navy.

MINING AND SCIENTIFIC PRESS.

ESTABLISHED 1860.

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Entered at the S. F. Postoffice as second-class mail matter.

J. F. HALLORAN.....General Manager

San Francisco, August 31, 1895.

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The Comstock Mining Situation.

The visit of Franklin Leouard, president of the Comstock Tunnel Co., to the Comstock mines has attracted attention. The company proposes putting its properties in better condition, hesides pushing work. Following Mr. Leonard came Senator J. P. Jones, his first visit to the Comstock mines for over five years. John W. Mackay has also arrived, being joined by D. O. Mills. The presence of these men and others interested in the Comstock, has been interpreted to mean the formulating of a plan to give that district renewed life. Whether this expectation, so far as a large-sized mining share deal is concerned, will be realized will be questioned, unless the work now being pushed in several of the mines develops larger deposits of high-grade ore than have as yet been made public. The Commission appointed by President Grant, under act of Congress, to examine and report on the Sutro (now Comstock) Tunnel, composed of distinguished and disinterested army and civil engineers, stated that "for a distance of five miles, with a varying width of from fifty to five hundred feet aud to an unexplored depth, the Comstock lode is found to be one of the richest, most productive and extensive in the records of mining. The Commissioners' researches convince them that the Comstock is a true fissure vein and cannot he exhausted by the work of man." That report was made Novemher 30, 1871.

Regarding the low-grade ore — principally gold bearing—on the Comstock the Commission reported that according to the testimony of some witnesses the amount ran up into millions of tons, ranging in value from $10 to $35 a ton. They stated that Col. Requa, superintendent of the Chollar-Potosi mine (now Chollar and Potosi mines), "in his various reports mentions the large amount of ores found that at some future time may be made available to the owners, hut which at that time could not be made available owing to the high cost of labor, transportation and reduction. He stated personally that very large bodies of $16 ore exist in the mine." The report further states "that a former superintendent of the Empire and Imperial mine (now Consolidated Imperial) stated that while in charge of that mine he struck a body of ore that assayed $19 per ton, which would not then pay to extract and mill. This body was prospected in the middle of lode more than oue hundred feet wide, to a depth of only six feet. How large this body of ore may be he was unable to say." The report then refers to a large hody of $20 ore in Ophir and also a large body of the same grade on the 200-foot level of Crown Point, and closes as follows: "From our observation, and the evidence of others, we do not hesitate in stating that vast amounts of what are designated as low-grade ores abound in these mines, that may yet be made available in increasing the national wealth."

From the time the above report was given out to within a year or so ago the mining companies have kept on hunting for "hig honanzas" and passed hy nearly all the low-grade ore. Coming to more recent years, we find that in the suit against the late Gov. Stevenson hy shareholders in the Kentuck Mining Co., it was brought out under cross-examination of the defendant that on the 1300-foot level of that mine they ran a crosscut through to gold-bearing ore assaying ahout $14 per ton. It had a width of over thirty-five feet. This same grade of ore is known to exist on the upper level of that mine, while in the adjoining mine (Crown Point) they are extracting from around the 700-foot level gold-bearing ore which mills over nine dollars a ton. This ore the company had reduced at two dollars a ton, flat, while they got a rehate of thirty-five cents a ton on the regular transportation charges of one dollar. At two dollars a ton for milling the gold ore the mill owners make a fair profit and it allows the mining company to meet all current expenses while engaged in very extensive exploiting work. Were it not for the latter work a handsome balance would be left each month; even as it is, it is expected that the hullion output from uow on will slightly exceed all expenditures, while the exploitation work under way is liable to strike an important body of high-grade ore.

There is in the Comstock lode large quantities of low-grade ore, mostly free-milling, and it is argued that, lying to the west, there is a lode of high-grade, gold-bearing ore; hut sufficient depth has not been made in it to demonstrate its character as to permanency downward. So far as it has been followed down or tapped by west workings in some of the miues, this lode has all the peculiar characteristics of a true-fissure vein. In the old workings west of the Comstock lode proper, it was followed down at several places to a depth of several hundred feet, but water and other obstacles interfered and work was abandoned. This high-grade, gold-bearing lode was found in the old Cole Mining Co.'s ground, Burning Moscow, Crœsus and other mines located to the west. Work in that direction down on the upper levels of Ophir, Con. Virginia, Alpha, Yellow Jacket, Confidence, Challenge, Con. Imperial, Belcher, Crown Point, Kentuck and others indicated that the west lode parallels the Comstock; and though not likely to have bonanzas or big pockets of ore, yet is considered a uniform bearer of ore milling from $40 upwards. It has been found to dip westward, whereas the Comstock dips eastward. In the Yellow Jacket, on the 550-foot level, a west cross-drift was run about five years ago that struck high-grade ore at a very considerable distance in, and which at the time was said to he the west or gold-bearing lode. Nothing has been heard from it since. At about the same time a west cross-drift from the 450-foot level in Alpha ran through ore of varying thickness, but aggregating over forty feet wide, which averaged over $60 per ton. This may be accidentally rediscovered later on. More recently, West Con. Virginia has pushed a cross-drift west on the 1100-foot level of Con. Virginia over 1400 feet, and is now waiting preparatory and necessary work so as to resume the westward continuation. At the time work was suspended, the formation of the rock and everything else encouraged the belief that they were close to the west lode. This cross-drift will drain that part of the district to a depth of over 1600 feet and admit of downward work being done from above. Gould & Curry is driving a west cross-drift from the 200-foot level which is in over 1500 feet. Bullion has a west cross-drift in over 1400 feet started from the 820-foot level. Work, it is expected, will he started before long hy the Comstock Tunnel Co. in connection with the mines located in American Flat to drain that end of the lode. The Tunnel Co. will, it is expected, inaugurate other important work during the coming year.

Besides the work noted ahove, important work is under way in the Gold Hill group of mines, which will lead up to more activity and a larger bullion output in the different mines, from Con. Imperial to Overman. This work is being done chiefly by Confidence, Challenge, Yellow Jacket, Kentuck, Crown Point, Belcher, Seg. Belcher and Overman. In Crown Point and Belcher the work is heing pushed west, to more thoroughly explore those two mines from the 600-foot level down to the 800-foot level. This is heing done for the purpose of striking the downward continuation of the high-grade gold-bearing ore found to the west on the 400-foot level. Referring to the ore found in Crown Point, P. W. Ames, former secretary of the Tunnel Co., wrote officially under date of July 19, 1887, as follows: "The new ore body in the Crown Poiut mine is an important one not only for that company but for the whole Comstock lode, and of course incidentally for us. This ore body was opened on the 400-foot level and is situated about southwest from their old shaft, but it is 400 feet west of their former working and 200 feet west of any point previously worked. Where the stopes are now beginning the ore body has been followed from 140 to 150 feet and shows a width of about 60 feet, of which 45 to 50 feet is good ore, going $40 per ton. On the 500-foot level a drift is being run to strike the vein, and a winze is down from the 400-foot level already about 70 feet and still in ore." While Mr. Ames reported the ore assaying $40, private advices stated that it was not only higher but was about all gold. The Crown Point Company, according to the official letter filed last week, have started a west cross-drift on the 600-foot level with the ostensible object of exploring the grouud to the west of the low-grade ore being extracted on the 700-foot level, and incidentally to make better air connection. It is believed that when this work is pushed to the west the downward continuatiou of the ore fouud ahove will be run into. This followed through discoveries to the west by the work to he pushed in Belcher will give to the Gold Hill group of mines greater life and activity than known since bonanza days, which will have an important bearing on all the mines in that district.

In connection with the above, it is in place to state that Mr. Lyman, superintendent of the Con. Virginia-California mine, is perfecting plans to exploit that mine in a northwesterly direction from the old shaft on the 1000-foot level. The object is to find if an accidental discovery made hy Mr. Tangerman, superintendent of the West Con. Virginia-California mine, at about 145 feet in the north drift ran from the old shaft on the 1100-foot level, does not make into something of great importance. By miniug men who have given consideration to the new find, it is believed to be the bottom of an ore hody. The formation and all indications seem to warrant this couclusion; hut as to its size or whether it will justify working will of course not he known until proper work has been done after connection is made between the 1000-foot and 1100-foot levels. In this part of Con. Virginia's ground there has not heen any work above the latter level, and therefore the finding of an ore body is among the probabilities when active exploiting is under way. This opinion is strengthened from the peculiar characteristics of the Comstock lode. Recognized authorities writing on this lode say that most of the ore hodies which have hitherto been discovered are situated in the east fissure. From the very nature of the case, and which was discussed in a former issue of the MINING AND SCIENTIFIC PRESS, this opening must have been exceedingly irregular. Ahove it lay only the sheltered edge of the east country, approximately retaining its position only hy gravity, while the mass of the east and west country was in motion. The deposition of ore in this fissure was no doubt dependent upon the disposition of openings which may have heen left at different stages in faulting. Two of the most important bonanzas have been found below the junction of the east fissure and the lode. One of them was in the Crown Point and Belcher and the other the famous body of the then California and the Con. Virginia mine. The former appears to have been deposited iu one of the ordinary lens-shaped openings which so frequently occur iu all veins from a non-conformity of the walls; but the latter seems to have had a somewhat different origin. A portion of the footwall appears to have given way at this point, carrying a large amount of rock from the hanging wall with it, and the ore deposited in the space thus formed.

Of course, the space referred to was not actually empty, but was filled with fragments, leaving considerahle interstices between them. These fragments, however, after decomposition, acted as absorbeuts for the mineralized solutions and became charged with argentiferous minerals. For the most part, and with entire propriety, they were mined and milled as ore. The new find made by Mr. Tangerman will not at all unlikely prove to be the formation from which the Con. Virginia honanza hroke away, in which event it will prove an open sesame to renewed life and vigor on that lode without regard to the uncoveriug of a gold-hearing lode lying far to the west of the Comstock.

Concentrates.

THE University of California has $400,000 to loan.

THE Grass Valley Miners' Union has $1000 to loan.

THE directors of the Kate Hayes Mining Company of French Corral have levied an assessment of $1 per share.

ORE from the Saowshoe and Cabinet rangos near Libby, Montana, is bringing that district into prominence.

A FRENCH syndicate has bonded for $50,000 the Mazatzal gold group in Touto Basin, Arizona, and a force of men is developing the property.

A PART of the 20-ton smelter for the copper mines on Illinois river, Oregon, has arrived at Grant's Pass, Oregon, on its way to its destination.

IN 1894 in the United States there were produced 14,804 tons of magnetically concentrated ore, and 72,312 gross tons of jigged and hand-sorted ore.

THE Melbourne, Australia, Mint received 537,944 ounces of gold during the first six months of 1895, as against 510,288 ounces for the same period in '94.

ALEX JANIN has filed a suit in the Superior Court against Howell Hines et al. for $9500, said to be due for working ore at Mioas Prietas, Sonora, Mexico.

THE Rogue River Mining Company has incorporated at Portland, Or.; capital stock, $100,000; incorporators, C. B. Spencer, A. F. Groves and Isaac Meyer.

THE Phœnix Mining Co., capital stock $500,000, has organized in Spokane, Wash., T. W. Witherop, president. The property is at Trail Creek, B. C.

THE Mines Investigation and Development Company is incorporated in Denver, Col., by T. W. Goad, M. P. Pels and W. Westoo. Capital stock $100,000.

THE Utica and Stickel mine is rapidly being unwatered, and by Monday it is expected the lower levels will again be dry enough for work to be resumed therein.

CRIPPLE CREEK, COLORADO, men think that camp will yield $10,000,000 gold in '95, and figure that the total gold output of the State for '95 will be nearly $20,000,000.

AT NELSON, B. C., judge has decided that in that province a mining claim, the location of which was recorded May 8th, '94, was not relocatable till midnight, May 8th, '95.

A NEWLY patented explosive called "chromite" is being introduced and, it is claimed, will become a strong competitor of dynamite in strength, safety and freedom from fumes.

THE North Bald Butte Gold Mining Company, with a capital stock of $100,000, has incorporated in this city. H. Vernon, A. R. Dow, G. R. Vernon, M. Prescott and F. A. Berlin are directors.

A GENERAL CONVENTION of the mining men of Washington, Oregon, Idaho, Montana and British Columbia has been called to meet in Spokane, Wash., to organize the Northwest Miners' Association.

THE Master of the Mint reports that the total gold yield of New South Wales for '94 was 324,787½ ounces; the Mining Registrar's returns for the same time place the amount at 246,904 ounces.

IN the big fire at Bingham, Utah, last week, P. McAvinny, a miner, lost his valise and his gold dust in the Griffin Hotel. He patiently panned the ashes of the ruin all next day, and recovered more than he had lost.

IN the Pinacate district, Riverside Co., 85 men are working on the Santa Rosa, Golden Chariot and Good Hope, and keep 30 stamps continuously dropping. Ten additional stamps will shortly be erected on the Santa Rosa.

C. W. HASTINGS and Sam'l Poorman of this city have bought the Ragon quartz and gravel mine, three miles from Nevada City, and will buy machinery and develop their property, which has been under bond for some time.

THE Carson, Nevada, *Tribune* says: "The sale of the Silver Star mines by Jim Yerrington is only a question of a very short time now. It is understood that there are several syndicates who are willing and anxious to buy."

FIGURES from the counties of El Dorado, Amador, Calaveras, Mariposa, Nevada, Tuolumne and Placer show a gain in population from 1890 to 1894 of 38.56 per cent, illustrating the general advance in mining interests therein.

ANDUS SMITH, of Milwaukee, Wis., the principal owner of the Slocan Star, Kootenay, B. C., is reported to have negotiated the sale of that property to an English company for $1,400,000. The report is discredited at the mine.

THE reports regarding great prosperity at Globe, Arizona, are misleading. No "600 men" are employed. There are about fifty miners working for wages in the camp, and about a hundred waiting and longing for an opportunity to work.

THE Secretary of the Interior has decided that there are no means whereby the work of the United States Mineral Commission in Montana and Idaho can be continued after September 15th, when the appropriation becomes exhausted.

THE Yreka Gold Mining Company has organized at Hollister, San Benito Co.; capital stock, $150,000, all subscribed. The company has acquired a mining property near Yreka, on Humbug creek, the old Spencer mine, and development work has commenced.

FOR the week ending the 8th inst., at the Broken Hill Proprietary (Australia), 3848 tons of ore were treated, yielding 266 tons of lead, containing 102,517 ounces silver; also 1175 tons treated by amalgamating and leaching plants, producing 11,364 ounces of silver.

THE total value of the clay products of the United States for 1894, excluding pottery, was over $65,000,000. The only comparison that can be made is with the census of 1890, which placed the value at $67,000,000. Fifty-three per cent of this value was in bricks.

BOUNDARY CREEK DISTRICT announces itself the legitimate successor of Trail Creek, B. C., as "the boom belt." Capt. Adams says "development and transportation are all Boundary needs to make a great district," which can with equal truth be said of a hundred other mining sections.

A PETITION for a rehearing of the Hale & Norcross case was filed with the Supreme Court last Saturday. The appeal is from that portion of the decision which decreed that Alvinza Hayward and his co-defendants should pay $210,000, with interest, on account of excessive charges for milling.

NEVADA CITY, Cal., miners formed a miners' union. The following named officers were elected: Pres., John Frandy; Vice-Pres., John Hocking; Financial Sec'y, Thomas Torpie; Recording Sec'y, Samuel Simmons; Treasurer, H. Jauch; Warden, Morris Eastis; Conductor, W. Harry.

IRWIN C. STUMP is quoted in a New York City paper as saying: "The great excitement in Europe over mines has extended to this country, and there are ten mines now offered for sale in New York to one in San Francisco. I think this movement in American mines will begin in the fall.

A RECENT legal decision is to the effect that a placer location made prior to the act of August 4, 1892, of land chiefly valuable for a deposit of glass sand and building stone, is not a legal appropriation of the land, and the subsequent intervention homestead entry of another will defeat the placer application.

A PROSPECTOR, talking of Cripple Creek, Colorado, says "it is the only camp that I know of which they prospect with plows, mine with road scrapers and literally ship the scenery." This is on a par with the old-time description of a part of Arizona, "where they cut hay with a hoe and cut wood with a hammer."

THE leaching mill at Keystone, Robinson district, White Pine Co., Nev., owned by A. Jackson and Henry Kiue of Eureka, burned to the ground last Tuesday night. One hundred cords of wood were also burned. The mill was erected about eight years ago by Harry Featherstone, at a cost of $10,000, and is a total loss.

T. F. CORNING of New York and H. P. Daniels of Denver are reported to have bonded mining property near Silver City to the extent of about $1,000,000. The property bonded includes the Black Jack group and the Trade Dollar group. If what they have already bonded is reported upon favorably, work on the Butte and California road will be begun.

THE Grass Valley Miners' Union has issued a placard giving names of mines now working in the Grass Valley district, as follows: Maryland, Empire, Omaha, W. Y. O. D., North Star, Granite Hill, Orleans, Osborne Hill, Electric, Merrimac, Massachusetts Hill, Shamrock, Perrin, Banner, Independence, Brunswick, Pennsylvania and La Marque.

A BUTTE, Mont., dispatch says a deal is closed there by which an English syndicate becomes the purchaser of thirty rich gold claims, known as the Clipper group, in Madison county, and owned by Morris & Elling and Carmen & Bennett. The consideration is $750,000. The Granite Mountain Company this week bought the Bullion, at Basis, for $100,000.

AROUND Anaconda, Montana, the rate for treating silver ores, which formerly varied from $12 to $14, is now reduced to as low as $9 for base ores and $8 for free-milling ore. This reduction has caused a little more leasing in silver mines than formerly, although no rate could be made by the smelters low enough to make silver mining profitable with silver at present rates.

"SECRET PROCESSES" are again reported successfully working beach sands. The aforesaid "secret" is "jealously guarded" by the owners. There is a good deal of such "secrecy" reported and a good deal of humbug generally connected with it. This time it is "at the Yakitat glacier on the Alaskan coast," where two men "got 180 ounces in 34 days." The story is very unlikely.

THE Western Federation of Miners, Butte, Montana, has issued a lengthy address regarding the Cœur d'Alene mines and miners, in which they say that "Wardner is a scab town, working under the guard of paid assassins." Our correspondents there, the local newspapers and the telegraphic reports have thus far failed to report any assassinations since the recent resumption of work at the Bunker Hill and Sullivan mines.

THE first decision of the railway mineral-land contest ever settled in the State of Washington was in the local land office last Wednesday, in the contest of A. L. Tinsley against the Northern Pacific, resulting in a sweeping victory for the settlers and miners. The contest involved three sections of land surrounding the Cleveland mine in Stevens county. The land is rich in mineral and the railroad fought hard to win, being represented by able counsel.

THE Printher, Price & Burnap Mining Co. is organizing at Los Angeles with $2,000,000 capital, with Dr. J. C. Price as superintendent, to operate in the Twenty-nine Palms district, San Bernardino county. The company owns several claims and is reported to intend ordering considerable machinery and thoroughly developing its property. There is considerable attention attracted to the desert region in that part of the State, especially since the McHaney strike at the Desert Queen mine.

THE sluice box at the Van Winkle, B. C., mine turned up a nugget in a peculiar form some days ago. It was in the shape of a sovereign made in her majesty's mint, London, in 1852. It was discolored, and had evidently been in the earth for years. It was probably lost by some miner in the early days, has the distinction as gold of having been twice mined, and is a peculiar example of the accidental here on earth. A short time ago four $20 pieces of the vintage of '53 were similarly unearthed in Shasta Co.

THE Homestake Mining Company's report for the year ending June 1, 1895, shows a surplus of $478,117. The net proceeds of the company's output of gold and incidental products was $1,537,807. In his report to Lloyd Tevis, president of the company, Superintendent Greer says: "The ore reported a year ago at the 800-foot level has been crosscut and found to have a width of 450 feet. We have twenty years' ore in sight." The Homestake mine is controlled by Mr. J. B. Haggin and other capitalists of this State.

THE Calaveras *Citizen* hears that the Gottschalk mine is again in the hands of its owner. The mine was bonded by Robinson & Veith in July, 1894, for a term of one year. In December, 1894, E. S. De Golyer bought the bond and started to work the property. On July 20th Judge Gottschalk, the owner of the property, upon solicitation from Mr. De Golyer, extended the time of payment for the property thirty days, or to the 21st inst. When this time had expired Mr. De Golyer asked for further time, but the Judge refused to grant it. The *Citizen* says another purchaser for the property will soon be found. The mine is one mile west of San Andreas. Two shafts have been sunk on the vein about 700 feet apart. The west shaft is in 110 feet deep and the east shaft is 195 feet. In the latter the vein is over seven feet wide, a great deal of the rock showing free gold.

ONE of the most profitable occupations of the United States Government is the coinage of five-cent nickel pieces and one-cent bronze pieces. The cost of the bronze disks from which the cents are stamped is about twenty cents per pound, and a pound of them produces $1.46. Nickel ready for coinage costs thirty-two cents per pound, and a pound produces $4.43 in five-cent pieces. The average profit of seigniorage on the coinage of these minor coins for the past few years has been about $650,000.

IT is reported from Spokane, Wash., that an agreement has been reached for the consolidation of the Poorman and Tiger mines on Canyon creek in the Cœur d'Alenes, Idaho. A new company has been organized, capital stock $1,000,000, to take the two properties, giving 500,000 shares for each. The Tiger is owned by S. S. Glidden of Spokane, and the Poorman by a stock company of Spokane and Montana mining men. The two properties are silver-lead, and have been worked since '88. It is expected that by working the two mines as one property a saving of $70,000 annually will be made.

OF the men employed at De Lamar, Lincoln Co., Nevada, mines there are 175 under the De Lamar Company and 25 in the April Fool mine. The others are scattered among various prospects. The Monitor and Jim Crow mines of the De Lamar Company are said to be on a true fissure vein, and there is enough ore reputed to be in sight to keep the mill running for five years. Thirty tons of ore that was recently shipped from the April Fool to the Salt Lake smelters gave a net yield of $18,000. Capt. De Lamar has offered to subscribe $4000 for a public school building if the citizens will furnish an equal sum for the purpose.

IDLE in a yard in Yuma is a mute reminder of the days of great expectations along the Colorado river twenty years ago. It is one of the largest—perhaps the largest—wagon ever built. The hind wheels are seven feet in diameter; the front ones five feet; the hubs are two feet long and two feet in diameter. The axles are steel. The wagon cost $2000, and had a carrying capacity of twenty tons when new. It was built at the order of Miller, Cargle & Co., to carry ore from Castle Dome to the Colorado river, twenty miles, but the company suspended operations soon after it was finished, and it has never been used.

R. H. GRIGSBY of Calistoga, who is in Durango, Mexico, in the interest of a San Francisco mining company, writes to a friend: "The country is rough. Where we went around the big Granite mountain, northeast of Weaverville, is a level country beside this. We have plenty of fine water; our mill (ten stamps, eight pans, four settlers) is run by water power (a Pelton six-foot water wheel, three-inch nozzle, eighteen-inch pipe, 120-foot fall). The ores here are low grade, but the great advantage is that silver here is worth $1.29 per ounce. It pays for all labor, wood, material, lumber, and buys most of the supplies we use."

THE Alaska-Treadwell Gold Mining Co. report that during the year ending May 31, '95, it milled 241,278 tons ore, which yielded $2.65 per ton. It cost $1.37 per ton to mill the ore, a net profit of $1.28 per ton. Of the $2.65, $1.70 was free gold, 95 cents sulphurets. During the year 200 men were employed, 170 whites, 30 Indians. The average wages were $3.50 for whites, $2 for Indians. The 240-stamp mill crushed the 241,278 tons at a cost of thirty-six cents per ton. The receipts for the year were $639,697, expenses $330,162, profit $309,535, showing what can be done with "a low-grade proposition." Dividends aggregating $300,000 were paid during the year, being six per cent on the capital stock.

THE July and August quicksilver receipts here aggregate nearly 7000 flasks. The receipts for the first six months of the year were 14,230 flasks. The exports by sea from Jan. 1st to June 30, '95, were 7439 flasks, valued at $283,668. Of this, 5000 flasks went to New York, 2194 to Mexico, 200 to Central America, 44 to British Columbia. The local price is quoted at $41. There is a steady increase in the quantity exported as compared with former years. The rail shipments for the first six months of '95 were 6959 flasks, giving a total shipment of 14,398 flasks for the first half of this year. In 1884 quicksilver was quoted at $30.50 a flask of 76½ pounds; in 1885, $30.25; in 1886, $35.50; in 1887, $42.25; in 1888, $42.50; in 1889, $45; in 1890, $52.50; in 1891, $45.25.

A MINE at Monthieux, near St. Etienne, in the Department of the Loire, France, was abandoned by its owners several years ago because it could no longer be worked at a profit. The discharged miners, finding themselves without work, formed a co-operative concern and obtained a title to the abandoned mine. They set to work, and by strict economy and unflagging industry made the mine pay. Miners in the neighborhood engaged with their employers in continual wrangle over wages, sought and in many cases secured employment in the co-operative concern. The founders of the latter, however, would not admit the newcomers on equal terms with themselves. When it came to the question of wages they would not pay to the new men the same rates that were paid to the co-operative owners, who, by extraordinary efforts, had turned a hole in the ground into a paying piece of property. When the new miners made a fuss the gens d'armes were called in, resulting in the dispersal of the malcontents with the usual threats, boycotts, etc.

Personal.

C. E. GRUNSKY, C. E., has removed his offices to 530 California St., room 23.

MR. LOU CAMERON, late manager of the Dominion Mineral Company, Sudbury, has been appointed manager of the Stratheyre Mines, L'd, at Fairview, B. C.

ASTRONOMER BARNARD'S place at the Lick observatory will be occupied by W. J. Hussey, late professor of astronomy at Stanford, from which place he has resigned to accept a position in the State University.

R. M. CATLIN, of Elko county, Nevada, leaves San Francisco this week for South Africa, where he has been engaged at a lucrative salary in the mines under control of Cecil Rhodes. Mr. Catlin expects to leave New York with his family about October 12th, and will be located at Johannesburg.

Mine Development the Basis of Great Prosperity.

To the Editor:—There is one feature connected with the mining industry which is but little understood and it is the matter of mine development, or to make it more clear I will say the lack of mine development. For nearly half a century I have been more or less identified with the mining interests of California and Nevada and consider myself as observing as the most of men; but not until the last year or so have I really grasped the extent of this great defect and detriment to our State's progress—not only of the State but of the people at large.

For the past two years I have resided in San Francisco and have given more or less attention to the promoting of mining interests, and in this way the fact of the universal lack of mine development has presented itself more clearly. Of course we all know there are many mining localities where "locations" are undeveloped, but that there is, comparatively speaking, one universal lack, is hardly comprehended.

This lack of development makes one point quite clear to my mind and it is that the whole system of mining laws relating to work is wrong, when the best interests of the whole people are considered, and this defective system is what leaves such a vast number of "prospects," as we will call them, to lie from year to year unworked. As it is now, and has been for years, a claim can be laid and maintained by simply recording and defining its boundaries and presumably doing $100 worth of work per annum, and here I will assert that not one case in twenty is $50 worth, actual value, put in per annum, on locations that are inactive. To my mind there should be laws for forced development after the locator's first year of occupancy, or a forfeiture of all interest in the same. A law of this character would cause the locator or owner to bestir himself, and it would not only be of great benefit to the community but to the locator. I would not advocate any law to cripple the miners; I am too closely identified with them. But this way of holding on, as some do, to five or six claims and do nothing by way of valuable development, and playing the "dog in the manger" in preventing others, is not for the best interest of the majority of miners of the State and certainly not for the community at large, as some single location thus held undeveloped by the present laws, under developing ones might be the producers of millions of money for the present generation, and one year is long enough to hold mining claims on this do-nothing order. Every one can see what a change such a law would make in the activity of every mining section, and I pretend to say that it would revert to the good of the owners themselves.

When it comes to the question of forced development or a forfeiture of all interests, I wish to say that but for the fact of forced development—the power of raising money by assessments—the Comstock would never have yielded up its four hundred millions of gold and silver, the most of which found a way into the business channels of San Francisco, giving life to trade and vigor to the people. But for this I doubt if $50,000,000 would be produced.

As before stated, I do not want to deprive the miner of any advantages for gain; but is not one year long enough for any one in these lightning times, when days of activity are crowded into hours, to consider if he can develop his find or get some one else to?

My desire in writing as I do is to see the miner more active, for "where there is a will there is a way." We want to be producing more gold and more silver, and we need not fear getting too much of the latter, as in 1896 we will make money of it—16 to 1—and build more mills with it.

Then, again, only development to a given depth should give a title, and not dollars and cents, and no title should be given on any claim until a shaft of at least 200 feet in depth is obtained, or a tunnel of at least 300 feet is run on the lode. This would be defined work and, being done, a perpetual title should issue to the miner without further expense. As it is now, to secure a title the miner is subject to an expense of from $300 to $700 for his patent. The miner has been the best friend of the Government, and now he wants the incentive of title after his expenditure for development; this point granted, and rapid development would ensue. This amount of work on any lode would clearly define the general character of the prospects and do for commanding the attention of capital for further development or prove it worthless. While I speak of a 200-foot shaft or a 300-foot tunnel on a lode, I do not consider this a developed mine by a long shot. My idea is that the real value of a mine is not determined short of 1000 feet in depth; but this costs money. And here I wish to state that I do not believe there is a mineral-bearing lode, of any well-defined character and which would pass the inspection of any creditable mining engineer, but what will develop a mining property of value, far beyond the cost of expenditure, at some point on the line of a thousand feet. This is more the rule than the exception, so that great wealth is in development and not in the eternal scratching on the surface.

To be sure we have developed mines in many mining counties, and many of them are 1000 feet in depth, all having been great bullion producers, ranging from $500,000 to $13,000,000 each; but where there is one, considering that we have been quartz mining for over forty years, we should have quadruple the number of active gold producers.

Let us reflect a moment on what South Africa has done within the past ten years, and to-day, as a result of its enterprise, is producing over $3,000,000 of gold per month. Here, in California and Nevada, with as vast and valuable gold fields as any spot on earth, we are, with over forty years' of experience, only producing the small sum of, say, $14,000,000 per annum, and all our business men are complaining of the slackness of trade and the scarcity of gold. Is it not apparent that there is a wrong to be righted? And while our Manufacturers' and Mechanics' Association are looking broadcast for the bettering of business, which will tend to enlarge their purses and make trade more prosperous, let them also encompass as one of the legitimate pursuits of prosperity the expansive industry of mining, and give their word of cheer and influence in advancing the miners' interest and landed rights.

But we will return to the state of affairs as they are before us at this time. When we stop to count up the developed properties of the various mining counties of the State and then consider the vast number of undeveloped ones, we comprehend the fact that millions lie buried, which under a different and more active system of development from what we are working and holding under would be doing good not only for our own population but for the whole world. There is not a single week but what I am in receipt of many letters from parties having "mines" which they desire to dispose of, and now and then comes a mining report, and I make the assertion that out of every twenty "mines" there will not be a single one deserving of the name of mine, and this from a lack of proper opening.

There is one very prominent idea in the minds of prospecting miners and it is that if they have a 50-foot shaft or a 100-foot tunnel on the lode that they have a mine; but where one good prospect has these, there are 100 of less development. If the people of the mining counties doubt this assertion let them cast their eyes over the mining field of their own section and figure on the developed lodes and undeveloped ones, and then they can realize what they have within their grasp in the way of golden wealth, with no one grasping for it. And why? I will answer: Because the amount of development does not justify the thousands of dollars generally asked for the property. In these later days of greater experience there must be something to show for the demand, and it must be so that it can be estimated by measurements, as to width, quantity and value per assays, and on this showing it is very safe to see if the demand is in excess of estimated value. And here let me say: The period when holes in the ground have a value is passed; there must be developed merit for coin.

San Francisco is flooded with "mines," but when the offer is critically examined into, even in the city, it too often falls short, and then if the "prospect" does present acceptable features and enough to induce the expenditure of time and money to examine the property, in nine cases out of ten there is something to be discounted.

At the present time there is an active demand for good developed properties, and I will say right here that it is less trouble to sell a good developed mine at a fair price than it is to find one. In one day I had five requests from the East and all wanted well developed, active, producing properties — not so much the production of bullion as the production of ore, as a guarantee for a milling proposition and so that some safe computation as to value could be made, to justify the price asked. It is a fact that it is almost impossible to meet such demands.

Now comes the question, How is this inactivity of mine development to be met? I do not know as my plan would be acceptable to the lazy miner, but the enterprising one would rather have less quartz, with a chance for more coin. "I have a fine mine but no money to develop it" is too often expressed, and too often a distressing fact, and this position of affairs is what we must meet.

Before I enter upon the plan of how, I wish to engage the mind of the reader to the fact of the possibilities of a great golden future; that for every present producing property we should have fifty, and if what we produce now is $12,000,000 per annum from the quartz reefs, we should produce at least $30,000,000. The business men of this and of all the mining States are seeking activity and enlargement of their business channels in order to accumulate more gold, and here on the Pacific coast our mountainous sections are ribbed with veins carrying the precious metals and many are lying idle for the want of money and muscle to open them. It is about time the communities, especially in the vicinity of these deposits, should awaken their sleeping energies and bring into active use the wealth at their very doors. To-day all Europe is alive with a mining spirit and sending their capital to South Africa, Australia and New Zealand, scattering a few dollars also on this coast. Suppose Europe was favored as is California and Nevada, is it likely there would be so little care for the great metallic wealth with which we are blessed? It is a remarkable fact that one seldom appreciates that which he has in abundance, and this may account for our neglect in not developing the treasures at our very doors. Californians want to begin to think of their mining empire, and by a system of rapid and extensive development begin the opening of the wealth that lies beneath the surface. We can boast of vast grain, fruit and vine fields—making California one of the most livable and enjoyable of countries and having a value of millions per annum—yet with all this surface wealth it falls into insignificance when compared to the wonder of treasure that lies underground. It is time the whole people began to realize the possibilities of the annual product of the precious metals, if they would but turn their attention and a minimum amount of capital toward developing them.

The British people have grasped the possibilities of the untold millions in South Africa and they have secured from the Government a tract of territory equal to all the mining districts of California, into which they are pouring millions of dollars and their surplus population, to unearth the buried treasure. It was British mining enterprise that opened the Witwatersrand of South Africa and which up to date has produced, since 1885, $116,074,928 in gold and which will yield for 1895 $40,000,000 more. Here let me state, that within this period, or say nine years, they have invested in mining enterprises about $134,000,000, in South Africa alone.

This is mining enterprise and it is the kind of spirit the people of this coast should exhibit; it is also the possibility of California and Nevada if we but throw in our energy, capital and muscle in bringing forth the buried treasure within our boundaries. The fact is clear to all, that there should not be any lack of business or prosperity in a territory possessing such varied resources as have California and Nevada, with less than a million and a half of people, combined. I speak of Nevada in connection with California from the fact that we have been since the first, and are now, so closely allied as to be almost of one interest. At the same time, my arguments and interests are in and apply to all the mining States and Territories. My desire is to see American mining enterprise equal that of any land; and viewing our vast mining possessions, if we but prove ourselves equal to the advantages before us, we should surpass them. But to do so we will have to bestir ourselves. For the purpose of opening the many undeveloped mining properties held by the poor prospector and claimant, it has been suggested that a syndicate of wealthy capitalists be organized and, under certain conditions, that they assume the work. But this is not far-reaching enough, but is good as far as it could be induced to go; besides it is subject to a good deal of distrust, which should not be, as agreements can be made capable of protecting the miner.

The plan which seems feasible to me, and likely to have the best results, will be for every mining camp to have its own developing company, made up of the merchants, manufacturers, miners, and I may say farmers of their own section, and that they enlist their friends elsewhere to take chances in working and finding mines. Let this company appoint a competent and reliable mine inspector for the purpose of selecting the best of such "prospects" as may be offered for development, on terms deemed just to both parties—the owner or owners on the one side and the development company on the other. To keep up this spirit of development, one of the conditions of the contracting parties should be that after the expenditure of a given amount of money, presumably enough to fairly open the mine, then both should agree upon a value and have the mine disposed of. Then more capital would be brought in for machinery and, in turn, for the output of a developed mine. A few such deals as this would give renewed life to all our mining towns.

These local development companies would not be subject to the same feeling of distrust as foreign companies, from the fact that they would be acquaintances, at least. To my notion, by this expenditure of money there is as much certainty of profit as by any class of business, provided your leading miner possesses experience, critical judgment and common caution. The sale of one developed property by the company would no doubt allow a good advance on the investment and thus induce the further movement in the same direction, and in time every mining center could be building up its own prosperity.

Some may say mining is too uncertain, but here let me state that mining of to-day is not what it was twenty years ago even. Labor is cheaper; explosives are not only cheaper, but more effective; mechanical devices have been perfected, and are cheaper; and with all these, electricity is distributing a cheap power, whereas in the past steam was expensive. Though all of these have tended to advance the profits, yet they are only a part of the great benefit that time and science have done for mining. Twenty years ago the average yield of ore value of all the milling in California was not to exceed one-half. To-day the per cent obtainable at at least one-third less

expense is from 85 to 95, and this is more easily secured than was 50 per cent twenty years ago. Thus it is reasonable to say that 40 per cent more value is obtainable to-day, at 30 per cent less cost, than was the yield and cost of mining, say, twenty-five years ago; and it is reasonable to consider that mining is one of the legitimate industries of this coast. I can assert that no business can be conducted with more certainty, provided unquestionable experience is at the helm of affairs, and, further, without experience and critical judgment, none is more uncertain. Mining cannot be conducted safely by men uneducated in the business, and this inexperience is what was at the bottom of so many failures in the past.

There is one more fact connected with our mining interest and it is that our educated California and Nevada miners are considered the peer of those of any mining country, and when it comes to the exact knowledge of how to produce the most, with the least labor and cost, they outrank them all. Then, again, in a mechanical sense, California mining machinery is superior in all its forms. With this and all that I have called the reader's attention to, we are to-day behind in our mining spirit. Is it not time there was an awakening? Is it not time we reached out more actively in order to unearth the treasures of the mining empire at our very doors?

ALMARIN B. PAUL, M. E.

Room 58, Crocker Building, San Francisco.

Buying and Selling Mines.

TO THE EDITOR:—Up to date the "mining exchanges" have contented themselves by opening offices in the cities and advertising for mines of merit, charging a fee for entrance and asking for a bond and agreement, covering their commission. As the average prospector is content with the MINING AND SCIENTIFIC PRESS and his county paper, the advertisement fails to reach him or if it does, his past experience has not impressed him favorably with these agencies. He would rather go out and find a mine than attempt to write out a description of the ore he possesses, and in consequence the mines sent in to the agency are some abandoned locations or unsalable properties that have been secured by the numerous bar-room operators. As the agency fails to secure mines it fails also in securing customers, and the office is abandoned. What is wanted at this time is a practical business corporation; this should have sufficient capital, as the amount that can be profitably invested is without limit. It should be in charge of a competent manager, who should have in his employ experienced men who "know a mine when they see it. These agents should make a personal canvass from mine to mine in each of the mining counties. When a property is found that has the earmarks of a mine in size and value of vein, with suitable location, good title and reasonable terms, a report should be sent in to the manager if offered the mine secured, an experienced miner put in charge and the property developed in the best manner to show its worth. When this has proceeded far enough to establish the merit of the mine it should be listed for sale, the work continued, and, when sufficiently developed, the mine equipped. If the bond expires by this time the property should be bought and worked as a business proposition until sold. Developed mines in profitable operation are not now for sale at prices that the average investor will pay, while the thousands of undeveloped prospects have so little in sight that the capitalist hesitates about investing, as he has neither the time nor inclination to develop the prospect into a mine. In every mining county there are to-day several properties that have a showing difficult to convince the experienced miner that they only need work to make them mines, while everywhere are to be found prospects that it will pay to give a short trial. Values are advancing everywhere. Prospects that could have been secured for hundreds a year ago are now held at thousands, while the five to fifty-thousand-dollar mine has gone up to twenty-five to one hundred and fifty thousand dollars. So also with the terms. The miner is no longer willing to bond his mine for a year without any consideration, but now exacts a portion down as an evidence of business. There is no business that will yield as great returns for the money invested as the development and sale of gold mines under competent, honest, business management. The old way of securing a mine and selling a small portion of the stock to pay for the mine, at a big advance on its cost, develop and equip the same and allow the operator to retain the majority of the stock at a big profit and at no expense to himself, has made several mining millionaires but has kept the industry in disgrace and turned capital into other channels. Of late the capitalists have been going direct to the mines themselves. The report of one, the general manager of one of the largest English mining companies, reads: "We secured a mine for five thousand pounds, the equal of which has never before reached London for less than fifty to two hundred thousand pounds." This departure must work for the good of the industry, for if any one thing more than another has served to damn mining among investors it has been the misrepresentation, over-valuation, and subsequent failures resulting from the purchase of worthless properties, on the strength of reports by high-priced experts. Every camp in the State and all other mining territories can point to magnificent failures of this class where millions have been invested and lost, and unfortunately by the very best of people. Your experienced mining operator, like Hearst, Hayward, Baldwin, Lane, and others, is not caught napping in this way, but buys a mine as he would any other property on his own judgment, and conducts it on the same business principles that he would apply to any other business.

Murphys, Cal., Aug. 19, '95. E. H. SCHAEFFLE.

Critical Periods in the History of the Earth.*

By JOSEPH LE CONTE, of the University of California.

INTRODUCTION.

Inapplicability of European Standards.—Geology was first studied in Europe, and the divisions and subdivisions of the rocks and of time were based on the great unconformities of the rock system and the great changes of the life system observed there. When investigations extended to other countries, naturally, similar conditions were looked for and apparently found. Closer study, however, soon showed that the correspondence was not complete for America, and seemed to fail entirely for India, Australia and Africa. The tendency, therefore, in recent years has been to seriously doubt whether there are any divisions which apply to all places; whether we should not give up trying to write a general history of the whole earth; whether the history of each continent must not be studied for itself. There seems to be a real danger of opinion going too far in this direction. It has been proposed, therefore, that this question be discussed by this Congress of Geologists.

It will be admitted that for a comprehensive view of any subject some knowledge of the history of thought on that subject is necessary. First, then, a few words on this history.

Early Views.—In the early part of the present century events of geological history were supposed to be not only removed from direct observation, but so different from anything now occurring that exact reasoning on them, based on observation of causes now in operation, seemed hopeless. The construction of the history of the earth by interpretations of its structure seemed, therefore, a legitimate field for the exercise of the scientific imagination. Hence it was that unconformities of strata associated with sweeping and apparently sudden changes of life forms were naturally attributed to violent and destructive convulsions of the earth's crust and wholesale exterminations and recreations of all life forms. Geological history was a succession of catastrophes, each inaugurating a new era, which remained substantially unchanged until another catastrophe. This view was in full accord with the then prevalent doctrine of the supernatural origin of new organic forms and the permanency of specific types, and regarded as a strong confirmation of the latter. Geology was not yet a science in the proper sense of that term. It was a field for the exercise of imagination rather than inductive reasoning.

The basis of modern geology, structural and dynamical, was undoubtedly laid by Lyell in the idea that the study of "causes now in operation" producing structure under our eyes is the only sound basis of reasoning from structure to history; and, similarly, the basis of palæontology was laid by Darwin in the "theory of evolution or origin of organic forms by descent with modifications." But by a natural revulsion from the previous catastrophism these new views, especially before they were modified by the doctrine of evolution, were undoubtedly pushed much too far, and became embodied in the opposite extreme doctrine of uniformitarianism. According to this view, things have gone on from the beginning at a uniform rate, much as they are going on now—changes of relation of sea and land, now here, now there, now in one direction, now in the other—oscillatory and compensatory, without detectable progress in any direction and without assignable goal. The view was conceived in the spirit of the physicist rather than of the biologist, and may be called physical rather than geological. The many changes in the history of the earth were compensatory, not progressive. The underlying idea was stability rather than evolution. And even Darwinian evolution, when accepted, was supposed to imply evolution at uniform rate—uniformitarian evolution.

Now, however, opinions are settling down into a view which is a substantial reconciliation of these two extremes, viz., that of gradual evolution both of the earth and of organic forms, but not of uniform rate. According to this, as I believe, truer view, in the gradual evolution of the earth and its inhabitants at a whole, there have been periods of comparative quiet, during which forces of change were gathering strength, but resisted by an opposite conservative force (crust rigidity in the case of earth forms, inherited character or type rigidity in the case of organic forms), and periods of revolution, during which resistance gives way, and conspicuous changes take place with comparative rapidity. Changes, indeed, go on all the time, but more rapidly at these times.

I shall not stop to illustrate and show how all evolution, just because it is under the influence of two opposite forces or principles—the one progressive and the other conservative, the one tending to changes, the other to stability—is more or less subject to this law of cyclical movement. Laws and forces, indeed, are uniform, but phenomena everywhere and in every department are more or less paroxysmal or catastrophic, though not catastrophic in the old sense of being not subject to law.

Thus the fundamental idea underlying geological reasoning was first catastrophism, then uniformitarianism, and now evolutionism. But evolution moves not at uniform rate, but by cycles, as explained above.

How Far May Divisions Be Made General?—Now the important practical question in regard to these revolutionary changes—which all must admit for special localities—is: How far are they, or at least some of them, general? How far may they, or any of them, be used to determine the divisions and subdivisions of geological history of the whole earth? This, as I understand it, is the question under discussion.

Until recently, perhaps under the still lingering influence of the old catastrophism, the prevalent idea was that all these great changes marked by unconformity and concurrent changes in organic forms were general. Under this idea European standards of classification have been used as a procrustean bed to which all others must conform, even in detail. This has been found difficult for our American rocks, and impossible for those of India, Australia and South Africa. Therefore the tendency of the present time among most advanced geologists is strongly toward a rejection of all general divisions—to hold that all such changes are local, and therefore all divisions of record and of time, both primary and secondary, and therefore all classifications must also be local. But again the danger is that by revulsion this tendency also may go too far. It is against this that I would raise a note of warning.

If, indeed, the earth has developed as a whole, as evolutionism would seem to require, then we ought to expect that amid many smaller and more local changes there must have been some greatest revolutions which have in some way either directly or indirectly affected the whole earth, and which therefore may be used to form the basis of the primary divisions of time. In the gradual changes of the earth as a whole, whether by secular cooling and contraction or by slowing down of rotation by tidal friction or otherwise, there must have been, from time to time, readjustments of the crust affecting the whole earth.

(To be continued.)

*Bulletin No. 11, of the Department of Geology.

Physical Properties of Metal.

It was remarked by Raoul Pictet that pure metals with high melting points—such as platinum, iron, copper and gold—are all comparatively strong; and, conversely, metals with low melting points—zinc, lead, cadmium, bismuth and tin—are relatively weak. Metals with high melting points must necessarily be coherent and tenacious, because much heat is required to drive their molecules apart in reducing them to the liquid mobile state in which the molecules have very small coherence; and, therefore, at ordinary temperatures much force must be applied to overcome the cohesion of the molecules and break the mass. Conversely, in metals with low melting points a small elevation of temperature will overcome the molecular cohesion and render them liquid—that is, will melt them. Such metals will be weak, because if little heat is required to melt the metal less force will be needed to tear it apart; hence melting point and tenacity are clearly connected. Professor Dewar has shown, moreover, that the tenacity of pure metals and alloys is greatly increased by extreme cold—that is, by the closer approximation of their molecules; and this affords additional evidence that metals become stronger at temperatures which are further and further removed from their melting point.

Natural Gas in 1894.

The annual report of the United States Geological Survey on natural gas, recently submitted by J. D. Weeks, says that the important gas fields now are those of western Pennsylvania, western New York, northwestern Ohio and central Indiana, but gas has been found in commercial quantities also in Arkansas, California, Illinois, Iowa, Kansas, Kentucky, Louisiana, Missouri, South Dakota, Tennessee, Utah, West Virginia, Wisconsin and Wyoming. The highest actually observed pressure of the gas has been about 800 pounds to the square inch, closed pressure. In all districts the pressure has decreased steadily and materially. Heretofore natural gas could be easily carried in pipe for long distances under its own pressure, but now, in most places, artificial means must be used to drive it to the place where it is needed.

Mining Summary.

CALIFORNIA.

Amador.

GOVER.—*Republican*: The work of taking the water out of this mine is a formidable undertaking. Several weeks have elapsed since the task was entered upon, and the water level has been lowered not over one hundred feet. The object in view is to reach ore bodies and take out a quantity of rock for a test crushing. If it pays $3 per ton, it is claimed there are capitalists behind the enterprise who stand ready to pay $150,000 for the property. This would be sufficient to pay off the entire indebtness and leave at least $50,000 or $60,000 to spare. C. E. Purinton is in charge of the operations, with a force of about twelve men, part of whom are engaged in cleaning out the south shaft—which caved in for about 200 feet last winter. Considerable supplies in the shape of wood and lagging are on hand. The taking out of the water is done by skip operated by steam power, and between had air in the shaft and unavoidable delays in hoisting operations, the work proceeds irritatingly slow.

ANITA.—At this mine drifting north and south along the ledge has been extended about 80 feet in each direction, the vein holding out for that distance. This gives an ore shoot of 160 feet in length so far developed. The general opinion seems to be that they are on the top of a fine body of quartz.

Ten stamps of the South Spring Hill mill are running on Median rock. It is contemplated to make another sinking.

The hoisting works of the Amador Queen No. I are expected to start up in a few days.

Calaveras.

TO BE REOPENED.—The Oriental mine, at West Point, is to be opened after being idle fifteen years.

THE PURE QUILL MINE.—*Echo:* At the Pure Quill mine, on the Smith Flat Lode, near Angels Camp, one shift is kept at work in the mine, pending the completion of the hoisting works. A ten-stamp mill will be built on the mine as soon as the other work under way is completed.

THE ROANOKE MINE.—*Chronicle:* At the Roanoke mine new machinery, consisting of a water power hoist and six-inch Cornish pump, is on the ground at the Lamphear shaft, which the company has determined to reopen and sink 1000 feet. A tramway is being constructed leading to the company's mill, 1500 feet distant. Ore will be transported by this tramway until the company can determine the extent and value of the rock, when, if found good, a twenty-stamp mill will at once be constructed on the Lamphear ground. The eight-stamp mill is running night and day, and the property is yielding good dividends. At present the payroll numbers 35 men.

THE DONNOLLAN MINE.—*Citizen*: The contract of Swenson & Nicols to dig a 65-rod ditch to connect the Donnollan mine with the Calaveras river was completed this week. The ditch is not quite to the mill, but will be connected as soon as needed. It has a capacity of about 300 inches of water. The mill is being overhauled and ten additional stamps are to be put in, making fifteen in all. Immense timbers have been hauled out there during the week to be used about the mill, which the proprietors expect to have in operation about October 1.

Del Norte.

WILL RESUME.—Col. Yates has closed down his mine near Crescent City owing to the scarcity of water. Negotiations have been concluded whereby the mine has been bonded to a Chicago company for the period of ninety days, during which time, however, Mr. Yates has the privilege of working the mine. It is understood that the price to be paid is $5500, and that the new company will erect a $10,000 plant and proceed to mine upon a larger scale than has hitherto been attempted. This is good news for Crescent City.

Inyo.

THE SACRAMENTO MINE.—*Register:* Work is going along steadily at the Sacramento. The water pipe is laid for 300 feet, from where the end of the flume will be to the wheel. The ten-inch V-flume will be put up at once, but owing to the rough character of the country it must be built in sections and carried to its final location. The arrastras are nearly completed, and will when in running shape be well worth an examination by any one wanting a new idea in such machinery. The plant includes two pits, the drag-rocks in both being run from one seven-foot belt wheel.

The Sacramento is one of the oldest mines of this section. It has been worked for years by leasers, whose idea was to get the most money for their time, consequently it has been "coyoted" rather than mined. Such a system—working the rock which looked as if it would pay best and discarding all other—has left hundreds of tons of fair ore lying on the dumps. Samples have been picked up horning into the hundreds, though most of it is of course low grade. These dumps will be worked at once, work in the mine being pushed along at the same time.

The resumption of systematic work on the Sacramento has led to renewed prospecting in the neighboring canyons, particularly by Mexican miners.

Mariposa.

THE RED BANKS.—*Miner:* This company will soon commence the erection of their dam across the Merced river. Mr. Brooks will have his contract of cutting 500,000 feet of lumber completed by Sept. 1st. Already several teams are engaged in hauling the timbers, etc., to the river. The iron work, such as bolts, rods, spikes, etc., are already on the ground; and Painter & McCandish, the contractors of the dam, intend to start as soon as enough material is on the ground. A full force of men are kept at work driving tunnels and otherwise opening up the mine that it may be in shape as soon as the mill is up.

THE TYRO.—The station in the 600 is now cut out and the work of sinking to the 700 is being pushed with all possible speed. Drifting both ways from the shaft is being prosecuted, and it will not be long before they can hoist sufficient ore to the surface to again start up the mill.

Captain A. H. Ward says he will return shortly to commence operations on the Pinon Blanco Co. group of mines.

AROUND COULTERVILLE.—*Miner:* The Merced Gold Mining Co. will soon commence the delivery of material to the site of their new dam across Black creek. They are pushing the work of sinking the two three-compartment shafts with all possible speed. A full crew are engaged in sinking the winze from the Potosi to the Melvina. The same active development is under way at the Mary Harrison. The company are having large quantities of cord wood, mining timber and building material delivered to the various claims, which is an unmistakable evidence of their intention to not cease work for a moment until the property is thoroughly opened up.

Nevada.

SUIT BROUGHT.—*Transcript:* H. B. Nichols, through his attorney, A. Burrows, has brought suit against C. M. Joyce of Chicago, to foreclose a mortage of $47,000 on the Nichols quartz and gravel claim situated near Dead Man's Flat.

THE OLD CLAY.—*Transcript:* Walrath & Stone have purchased a hoisting and pumping plant for their mine in Brown's valley. They have named the mine the Old Clay. The machinery will come from Nevada City.

A NEW GRAVEL MINE.—The Live Yankee gravel mine is situated at Bald Mountain, near Graniteville, and from all indications will prove a valuable one as soon as it is opened up. It is owned by twenty young men of North Bloomfield and they have been working there for some time, three shifts a day being engaged. A tunnel has been run 400 feet, and is one of the finest tunnels in the State, being seven feet high and five feet wide. It is thought the channel will be reached in another 100 feet, which is expected to be completed about the middle of September.

In running the tunnel several rich pockets of gravel have been struck, which prospected at the rate of a dollar to the pan.

Plumas.

THE GOOD HOPE MINE.—W. C. Rees has the contract for erecting the restrainiug dam authorized by the Debris Commission at the Good Hope gravel mine below Oniou Valley At the base this dam is 44 ft. long and on top 210 ft., with a base 30 ft. wide. The dam is to be 40 ft. high. It is what is called a log-crib dam, anchor boiled to the bedrock, the logs being drift-bolted together. The company will lay about 1600 ft. of pipe, through which, after leaving the ditch, the waters of Onion Valley creek will be delivered at such a point as will give 240 ft. pressure at the mine. The company expects to be ready for active operation of the property next spring.

Shasta.

WATER FILINGS.—*Searchlight:* Wm. M. Fitzhugh of San Francisco, by his representative Geo. B. Hine, has filed on 150,000 miners' inches of water to be taken from Pitt and McCloud rivers, and utilized in generating power. The proposed plant to be established near the junction of these streams, and power to be transmitted from here, for use for mills. Mr. Hine says that much will depend on the success of the plant recently started at Folsom. To hold his filings Mr. Fitzhugh will have to commence work within sixty days.

THE IRON MOUNTAIN CO.—*Free Press*: Simultaneous with the driving of new tunnels to uncover immense ore deposits at the mine, there is a large force of workmen pushing the railroad enterprise. Several camps are located at various points and the graders are preparing a roadbed.

The company expects to force railroad building right through, completing the work in ninety days; but it will hardly be possible to do the work in that time.

The track used will be narrow gauge, three tracks to be laid from the smelter to the Southern Pacific track, in order that the cars of both railroads can load and unload at the smelter and Southern Pacific depot.

When all is in readiness for the treatment of ores at the smelter, it is estimated that 1000 men will be in the employ of the company, and that with this number constantly employed it will take forty years to exhaust the ore bodies.

Outside of the fact that this enterprise in itself will be of untold benefit to Shasta county, by the erection of the smelter it will be made possible for every small mine owner or prospector in the county to make money, as it is stated that the Mountain Mining Company will purchase all silicious ores having a value in excess of $4 per ton.

OREGON.

Jackson County.

Writing of Jackson County placer mines Leigh Harnett says at the Beekman & Huffer quartz mine, on a high hill three miles west of Jacksonville, Mr. Beekman is said to own 160 acres and he was told that within a radius of half a mile from the mine in question there are seven ledges. For so short a space that is something new in geology. More than likely, when development work brings more correct ideas, it will be found the lower deposits of ore, now thought to be ledges, are nothing but fractures from the intact ledges above. It is scarcely possible in creation for seven intact ledges to exist at depth in the narrow space of half a mile. Nevertheless, it is true the location now spoken of embraces three ledges, and that the company are opening the second and third. "In the upper tunnel on the second ledge, 105 feet long when I saw it," says Mr. Harnett, "the vein was two feet wide all the way, with both walls showing out in excellent form. The ore all along the tunnel and on the dump is really rich. Midway in the tunnel a hole some ten feet deep has been sunk to test the ore, and in this it is found still richer. In the lower tunnel the vein spreads out to cover ten feet and in streaks is very rich. From appearances it is not likely the vein will continue its present width, and for permanency at depth it is to be hoped it will not. As a proof of the richness of the ore, I may state 100 pounds were sent to the Selby smelter at San Francisco, which on reduction paid $800. This is enormous; but Selby can always be relied upon. There are also some remarkably rich streaks of silver in the ore, a thing I was not expecting in southern Oregon until Mr. Huffer called my attention to it. Were I an owner in the mine, however, I should regret this duplex ore, as the silver, apart from its depreciation in value, will give much trouble in the final reduction. A good mill is in course of erection, and when completed will run total expenses up to $6000."

SALE REPORTED OFF.—It is announced that the contemplated sale of the Black Butte mine is off, and that the present owners, John Gagen, T. C. Taylor, J. M. Herman, M. G. Munly and T. J. Munly, who recently incorporated, will proceed with the development and operations. Mr. Gagen asserts that there are in sight 200,000 tons of ore on the Black Butte, and that it is easily worked ore. He expects this summer to be sending in bullion bars to Pendleton.

WILL PUMP WATER.—Major Newell, who has been experimenting with a boat intended to pump auriferous gravel from the bottom of Rogue river for the past several months, has leased a placer claim from Wm. Hamlin, two miles from Grant's Pass, and will use the engine from his boat to pump water for the use of the mine.

Jas. H. Kincaid has sold his interest in placer mines in Willow Springs district to B. W. Huston, who with J. W. Ingram will put in a hydraulic to operate them.

NEVADA.

Robinson District.

The Eureka *Sentinel* hears that J. B. Willson, who is at Ely in the interest of a San Francisco syndicate, has offered $150,000 for Chainman mine. Among the conditions named are a given time to complete the purchase of the property, the erection of a 25-stamp mill and pumping machinery of a sufficient capacity to drain the mine. The vendees will guarantee to have all of the machinery in working order in four months, to pay the owners 40 per cent of the gross yield of the mine for that period and the balance in cash if they determine to conclude the purchase. The same parties have also the purchase of the Keystone property under consideration.

BRITISH COLUMBIA.

AN EXTENSIVE MINERAL BELT.—Attention is being directed to the country twenty-five miles south of Nelson, where veins similar to that discovered at Rossland have been located. Discovery is reported of a similar class of ore five miles north of Rossland on Murphy creek, and at Sullivan creek, nine miles north of Trail creek. The belief of those familiar with the country is that the same belt of mineral extends from Rossland across the Columbia through to the valley of the Salmon river near the Nelson & Fort Sheppard Railway.

BIG DITCH FINISHED.—At Cariboo the Cariboo Hydraulic Company's big ditch was completed on the 19th inst., and water turned on, so that the company does not expect any further trouble regarding water supply and will be able to run till the end of the season.

AROUND ROSSLAND.—The new machinery on the LeRoi is in operation. The largest shipment ever made from that mine in one day was 107 tons. There are now about 100 men employed on the mine.

The War Eagle has commenced shipping again.

A body of ore has been struck on the Robert E. Lee at a depth of 60 feet.

They are working in shipping ore on the Homestake and have two carloads on the dump. This ore is different from any other in the camp. The last assay ran 70 ounces silver and $12 gold.

At the Crown Point the shaft is now down 20 feet, all the way in the ore body, and they have taken out over 100 tons.

ALASKA.

AT BERNERS BAY.—*News*: The steamer Rustler arrived from Berners bay yesterday morning and reports mining operations of the Berners Bay Mining & Milling Company to be in a most flourishing condition. During the past two weeks the tramway from the Bear group of mines has been completed and they expected to begin carrying ore to the mill to-day. Within a week the mill will be running to its fullest capacity and night and day the hills will reverberate with the echoes of forty stamps pounding away on the richest ore in Alaska. The new Gates crusher is in position and will be put in operation at the same time the additional stamps are put to work. This crusher is so arranged that it will break the ore finer than usual and it is thought the mill will easily handle from 140 to 150 tons of ore daily. The several ledges recently cut in the Bear crosscut have been developed to such extent that they could furnish plenty of ore for the forty stamps, but as plans now exist twenty stamps will be run on Comet ore and twenty on the Bear. A recent clean-up of a two week's run on Comet ore with twenty stamps produced two beautiful yellow bricks which could not be but perfectly satisfactory to the management. About 300 feet of drifts and levels are run each month and the company is now employing 150 men. A new storehouse 30x70 is in course of construction, the wharf has been extended to deep water so boats can land at any stage of the tide, and Supt. Willis Nowell has had new offices and quarters built for himself. Work on the new ditch 3,000 feet long which is to greatly increase the water supply is well under way and will be completed in a few weeks. It is the purpose of the company to run all winter and they are now installing a complete steam plant to be used as an auxiliary power when the water supply fails. The engine, which is of 130-horse power, boilers, etc., together with several thousand fire brick, arrived on the Topeka and as soon as loaded on a scow will be towed to Seward City. Two compressors will be included in the plant, one for the Bear mine and one for the Comet.

A FAVORABLE SHOWING.—The July report of the Alaska-Treadwell Gold Mining Company of Douglas Island, Alaska, shows that the mill crushed 23,800 tons ore, which averaged $3.69 per ton, besides 417 tons sulphurets worked, yielding $28,830. The bullion shipment for the month was $87,756.

IDAHO.

"GLACIAL GOLD."—The *Silver Hammer* says: If as much gold was taken out in any other county, in this or any other western State, as there is now being gathered on the South Fork there would be a regular boom. Over 100 men are making from $3 to $7 per day washing glacial gold by the rocker method on the south fork of Snake river in Fremont county.

THE YELLOW JACKET.—Prof. N. A. Bibikov, a Russian geologist, is making an examination of the properties of the Yellow Jacket Mining Co. The company are operating forty acres of property. The manager, P. J. Arkel, in a period of ninety days, has put in place a new sixty-stamp mill, and has completed over a mile of pipe line, which brings water to the mine and mill from Yellow Jacket creek. The nearest railway station is at Red Rock, Mont., 125 miles distant.

The Yellow Jacket is a gold proposition, producing at the rate of $25,000 per month. The old mill was destroyed by fire last summer. The mill now in use was furnished by the Frazer & Chalmers Company of Chicago. The ore deposit of the Yellow Jaeket is similar to that of the Homestake in Dakota, but the grade is higher, averaging $15 per ton, and all free milling. The company expects to operate all winter, and to increase the mill to 100 stamps early next season.

MONTANA.

THE PARROT DITCH.—The new Parrot ditch will be completed by September 15th. It is 18 feet wide at the bottom and will carry between 15,000 and 20,000 inches of water. It has a fall of 100 feet at the lower end, and will be 18 miles in length.

WYOMING.

"FIFTY DOLLARS A YARD."—At the Rinker & Davis discovery at Gold creek placer dirt is declared to go $50 to the square yard. Engineers have been sent to see if water can be taken from the mountains just above the placer ground, and if it can be done a ditch will be constructed. Parties who are investigating the ground say that there is no deposit of gravel in that section, so the gold must come from between there and the mountains, and miners are anxious to trace the source of supply. Gold creek is on the Continental divide at the south end of the Wind River range.

UTAH.

ONTARIO'S FORTY-SIX BARS.—S. L. *Tribune*: Forty-six bars of bullion, containing 21,836 fine ounces of silver, were received in this city yesterday from the Ontario, and the proceeds placed to the credit of the company. This represents the earnings of the bonanza for a week. The Daly, which is also under Hon. R. C. Chambers' management, is producing about half that amount.

Work on the great tunnel, which has now penetrated the hill for a distance of 15,490 feet, is still progressing. The breast is now at a point 1293 feet beyond No. 2 shaft, and that the purposes for which it was constructed are being fulfilled is revealed in the increased earnings of the property that is pierced by it.

BINGHAM'S TUNNEL SCHEME.—*Tribune:* Perhaps the boldest project that has been launched in Utah the present year is that which means the driving into the Oquirrh ranges at Brighton of a tunnel that will afford an outlet for the ores of no less than twenty-five mines that lie along its course. The great enterprise is undertaken by the Bingham Tunnel Company, and is the work of persevering endeavor on the part of those who have decided that Bingham is entitled to an outlet such as are to be found in Aspen, Leadville, Ouray and camps of similar magnitude. The tunnel will penetrate the range to a distance of five miles, and, connections with the various mines having been made, the production of ores should be less than one-half that which is now involved. This means much for Bingham and much for the smelters of Salt Lake City, and both can afford to work to an end that will witness its speedy consummation.

A NEW PROCESS AT BINGHAM.—For three weeks Col. Heffron, tells the *Tribune*, a new process for the extraction of gold from the ores at Bingham has been undergoing tests in that camp.

The process is what is known as the Kendall dioxide (sodium) cyanide process, the owners of it the American Cyanide Gold & Silver Recovery company. It is very similar, as described, to the cyanide process, this dioxide of sodium being added, it is said, to accelerate the action of the cyanide of potassium. The quantity of cyanide, it is said, varies according to the character of the ore with which it is dealing, although generally less than one per cent with the dioxide about one-fourth of one per cent. These, in solution at the percentages named, are applied as a leach to the granulated ore. The ore is

charged into n series of tanks or vats, where it is flooded with the solution. After a certain period of leaching the solution, which is now impregnated with the values, is drawn from the tanks and passes into the apparatus where it is brought in contract with an amalgam consisting of zinc and mercury, which the inventors have substituted for the zinc shavings introduced in the MacArthur-Forrest process. This amalgam, it is contended, absorbs the values contained in the solution, and from that the metals are removed.

COLORADO.

DENVER SMELTERS SHOW INCREASES.—Five of the leading smelters of Colorado have prepared comparative statements of their purchases of gold, silver, copper and lead ore for the first six months of the two years 1894 and 1895, a summery of which follows:

Lead—1894, 40,218,108 pounds; 1895, 38,758,-019; decrease, 1,460,149 pounds.

Copper—1894, 1,378,519 pounds; 1895, 2,331,-590; increase, 933,071 pounds.

Gold—1894, 105,441 ounces; 1895, 197,351; increase, 91,910 ounces.

Silver—1894, 7,674,911 ounces; 1895, 8,053,-327; increase, 378,416 ounces.

EL PASO CO.—The New Henrietta Gold Mining and Development Company has been incorporated by S. G. Sims of Cleveland, O.; J. W. Lane and E. Rotherg of Cripple Creek to operate in El Paso county with $500,000 capital stock.

EL PASO REDUCTION WORKS.—The El Paso Reduction Works at Gillett has 200 tons of ore waiting for treatment and 4000 tons contracted for, and is working a day and night capacity of sixty tons every twenty-four hours and turns out $90,000 per month. It treats ore averaging from $30 to $40, and, it is claimed, saves 95 per cent of the gold. They charge $8 for hauling and treatment and pay 95 per cent of the assay value to their customers.

ARIZONA.

PUSHING DEVELOPMENT WORK.—John Kasser, manager of the Kusser Gold Mining & Milling Co., is pushing development work on their mines. They have two tunnels, with track laid, 325 and 150 feet respectively; also a 100-foot tunnel and two drifts on the lead of of 50 or 60 feet each. The shaft is down 200 feet. There are about 300 tons of ore on the dump, and considerable stoping ground in the mine. Preparations are being made for the erection of a mill.

THE CONGRESS MINE.—The cyanide process at the Congress mine is said to be working very successfully on the tailings from the mill. It is also given out that the stamp capacity of the mill will be doubled soon by the addition of forty more stamps. This comp, next to Jerome, is the liveliest in the territory.

AT JEROME. — The United Verde Copper Company has completed a line of sluice boxes 700 feet in length for running off the water of the drain tunnel. The boxes are 12 inches wide, 12 inches high: each 12 feet long, of 2-inch planks. In the boxes large pieces of iron are placed to precipitate the copper contained in the water from the mine, as it runs through the boxes. By this method the company are deriving a revenue of $150 per day. This copper water has been running to waste for years. Mr. Clark, the principal stockholder, is having made six converters double the size of the present converters. When these converters are in place at the works and running the gross output will, it is expected, be increased one-third. The output for 1894, it is said, was 10,000,000 pounds of copper, 750,000 ounces of silver and $1,500,000 gold.

THE EMMET MINE.—*Courier:* The Emmet gold mine, located near the Jerome wagon road, at the foot of the Black Hills, has been bonded to capitalists for a large sum of money. They will expend several thousand dollars in development, commencing work next month. Ex-Gov. Powers, of the real estate firm of Powers & Doran, owns one-fourth interest in the Emmet. The other owners reside in Cleveland, Ohio.

ORO BLANCO DISTRICT.—A mining deal was closed on the 28th at Tucson wherein Supt. H. Harrison of the Franco-American Mining Company purchased the General Dietzler group in the Oro Blanco district. Active operations involving the expenditure of $25,000 in mills, reduction works and development will soon be begun.

MARICOPA COUNTY.

Gazette: Good reports come from the anciently located Brown Nigger mine, Black canyon district, where Ross & Keegan have sunk a shaft 75 feet deep, about water level, from which a 50 ft. drift has been run to connect with an old shaft sunk years ago by Nigger Brown himself. The shafts were connected to secure good air. The workings are all in good free gold ore which ranges in value from $30 to $50 per ton. Near by the same parties are working the old Jack Swilling mine, where Swilling laid out and named the now extinct town of Jamestown. Swilling worked this mine in 1865-7-8-9 and 70. Some of the ore ranges in value as high as $500 a ton. This rich ore was exposed on the surface in an unworked part of the mine by a heavy downpour of rain. Swilling's original location notice, written by himself, is now on record in Maricopa county. It reads: "I claim 300 feet on either side of this vein and as far north and south as my winchester will shoot."

THE NEW MILLS of the Grand Rapids Pulp & Paper Co., at Bearin on the Wisconsin river, are being rapidly pushed forward. The company is constructing a dam, excavating a large mill pit from solid rock, and erecting large substantial brick buildings. They have contracted with James Leffel & Co., of Springfield, Ohio, for fifteen of their large Samson Turbine Water Wheels, which will be in position in November. All the work is being done upon the most approved plan, and is of the most substantial character.

The Proposed Compromise.

The mineral land committee of the State Miners' Association met at the office of Chairman A. H. Ricketts in this city last Wednesday afternoon to consider the compromise proposition offered by Mr. W. H. Mills, representing the S. P. Co., in a letter to Mr. Jno. M. Wright, representing the mineral land committee, of date Aug. 21st, which was fully discussed in these columns last week. Messrs. Ricketts, Wright, Yale and Hoffman were present. Mr. Loftus, the other member of the committee, is in Tuolumne county, but wrote strongly opposing the railroad proposition as outlined in Mr. Mills' letter.

The whole matter was fully and freely discussed; the fact that the original proposition emanated from the railroad company, and was taken up by the committee in an honest desire to do equal justice was brought out, and the additional fact clearly shown that the committee or the association is not "fighting" anything or anybody through any desire for conflict or reprisal, but in its determined, intelligent effort to preserve the mineral area of the State from illegal absorption if it find anything or anybody in its path it of course will make most strenuous effort to remove the obstacle.

It was the expressed judgment of the committee that the proposition as outlined lacked sincerity and was not feasible; the objections to it were so manifest and the merits of the proposition so meager, it was so one-sided in its suggestions, so chiding in its tone and so dictatorial in its conclusions, that the committee felt that justice to the interests represented could not be served by an acceptance of the "compromise" proposition.

It was finally decided that the committee formulate a reply to Mr. Mills' communication, suggesting the wisdom of three commissioners in place of two, as he proposed, and declining his proposition that the committee withdraw its protests, at the time suggesting that when the railroad company evinced a willingness to withdraw its selected lists and recede from the position it has assumed would he time enough to ask the committee to abandon its present successful line of action. The committee then adjourned. In six weeks will take place the Annual Convention of the State Miners' Association, when the whole matter will receive further attention.

California Miners' Association.

Call for the Fourth Annual Convention of the California Miners' Association.

The annual convention of the California Miners' Association will be held in San Francisco, at Pioneer Hall, Fourth street near Market, on Monday, the 14th day of October, 1895.

County associations are hereby notified that in accordance with Section 4 of Article IV of the constitution of the California Miners' Association, each county organization shall be entitled to one delegate to the State convention for each ten members, said delegates to be selected as such county organizations may determine.

The fostering of the mining interests of the State of California will be discussed at the coming convention, and the principal subjects which will receive attention will be the reports of the committee on legislation. [The full text of the bill to amend chapter 6, of title 32, of the Revised Statutes, relating to mineral lands and mining resources, has appeared in these columns.]

Following is a bill to appropriate money for the construction of works to impound mining debris, and thereby to protect the navigable streams of California:

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled—

SECTION 1. That there is hereby appropriated out of any money in the treasury not otherwise appropriated the sum of one million and thirty thousand dollars, which shall be immediately available and shall be expended under the direction of the Secretary of War, in accordance with the plans, specifications and recommendations of the California Debris Commission, appointed under the act of Congress entitled "an act to create the California Debris Commission and regulate hydraulic mining in the State of California," approved March 1, 1893, for the purpose of constructing works for the restraining and impounding of mining debris upon the tributaries of the Sacramento and San Joaquin rivers in California and the branches of said tributaries.

SEC. 2. Whenever any such works for the restraining and impounding of mining debris shall have been constructed out of such appropriation, or shall have reached such a stage as, in the opinion of such Commission, it shall be safe to use the same, it shall be lawful for such Commission to make the order provided in Section 13 of said act, upon proceedings being first had and taken in accordance with the provisions of Sections 9, 11 and 12 of said act, but in such cases the owners of the mines affected by said orders shall not be bound by the proviso to said Section 13 of said act nor by the provisions contained in Section 16 thereof.

SEC. 3. The said Commission shall also have the power to make the order provided for in Section 13 of said act as to any mine or mines whenever it shall appear to the satisfaction of said Commission that no impounding works are necessary other than the means already provided by nature to protect from material injury the navigable streams mentioned in said act and the land adjacent thereto, upon proceedings had in accordance with Sections 9, 10 and 12 of said act.

The question of the protection of mineral lands of the State of California against the encroachment of the Central Pacific and other railroad companies will also be considered.

County associations are once more urged to help, in every way possible, with funds to carry on the work which has been so ably begun. A large representation is desired. By order of the executive committee.

W. C. RALSTON, Secretary. J. H. NEFF, President.

San Francisco, Cal., Aug. 28th, 1895.

Coast Industrial Notes.

—Commencing September 2nd a rate of 65 cents per 100 pounds on canned goods (minimum weight, 24,000) will be put into effect from all California terminals to Chicago, Buffalo, Cincinnati, Pittsburg, and all intermediate points over the Santa Fe route via Mojave.

—An Austin, Nev., *Reveille* reportor gravely tells a listening world that a man named Reese is engaged in killing wild horses in the Edwards Creek range for the purpose of getting the hides and tallow; that the hides bring $3.50, and the tallow, when tried out into oil, is worth $1.50 per pound.

—During July the ten principal cargo mills of Puget sound shipped 31,692,844 feet of lumber by water, the largest amount, with the exception of June, for any month during the current year, the increase of over 4,000,000 feet in constwise shipments making up for a falling off in the foreign shipments as compared with June.

—It is reported in San Diego that the Southern Pacific has secured control of the Cuyamaca railway, and that $500,000 of the bonds have been purchased at 30 cents on the dollar. The secretary of the Cuyamaca road says no sale has been made to the Southern Pacific or to any other outsider.

—The Southern Pacific Company, the Pacific Mail Steamship Company, the Occidental & Oriental Steamship Company, the Peninsular and Oriental Steam Navigation Company, and other rail and water lines, have entered into a contract whereby a passenger may buy a ticket around the world from any point on any of the lines joining for $610.

—The earnings of the entire Atchison, Topeka & Santa Fe system for the twelve months ended June 30, 1895, on an average operated mileage of 9150, or 188 miles less than in the previous year, were $39,795,802—a decrease of $2,529,595; the operating expenses were $30,012,690—a decrease of $985,524; and the net earnings $9,783,111—a decrease of $1,544,071.

—By January 1st, '96, 1000 M. feet of Washington fir and cedar will be made into box cars for the Great Northern railway, which has let an order for 250 cars. The contract provides that the woodwork be entirely of Washington fir, with the exception of the roofs, which are to be of Washington cedar. Orders have been placed for the lumber among six mills.

—Water tanks are sent from this city to the Hawaiian Islands, where they are a necessity. In large districts the inhabitants depend on rainwater for drinking and cooking. Redwood tanks, when filled with water, are not attacked by beetles. Their sizes, five feet to eight feet in diameter, six feet to twelve feet high, vary according to the sizes of the buildings. The staves are from 2½ to 3 inches thick.

—Last winter it was formally announced that an exposition of industries and fine arts would be held in the City of Mexico next year, to open April 2d and continue six months, and during the spring the papers published the details of the organization and rules and regulations and various information for American exhibitors. But for the last two or three months all reference to this proposed exposition has subsided, and even our Mexican exchanges are not saying anything about it.

—The State Board of Prison Directors and J. L. Maude, Commissioner of the State Bureau of Highways, at a meeting at Folsom last Saturday to consider the establishment of a rock-crushing plant at that place, decided to put in a plant of the capacity of 900 tons, or 90 carloads per day. For districts remote from the source of supply the Board recommended that each locality he provided with a portable rock crusher and a road roller weighing eighteen tons to he operated by a gasoline engine. The cost of gasoline is about $2 per day. Proposals will be advertised for.

—At a meeting of the Marysville City Council, bids for furnishing a pumping plant for the new sewerage system were opened. The Risdon Iron and Locomotive Works bid: Pumping plant as per specifications, $7195; same with Heine boiler, $7695; same with horizontal tubular iron boiler, $7210. Byron Jackson bid: For pumping plant capable of pumping 15,000 gallons per minute, 15 feet high, or 22,500 gallons per minute, 10 feet high, $10,000, and also submitted a proposition to furnish another plant according to plans and specifications for $11,000. The Babcock & Wilcox Co. made a proposition for furnishing a boiler for the pumping plant for $1803.

—Few people catch fish at a depth of 800 feet. There are fewer fishermen at a depth of 4500 fathoms or 27,000 feet. This is a depth of about five and one-half miles. Uncle Sam is the only angler in the world who insists on such deep-sea fishing, and measures depths not by hundreds of feet, but by miles. He has a boat built especially for the purpose. The vessel, the United States Fish Commission steamer Albatross, comes into California harbors frequently, and is an object of rare interest to the landsmen. The Albatross is strictly a scientific fishing craft. She cost over $100,000, is 234 feet long and of 1074 tons displacement, with a brigantine rig. Her business is to follow ocean fish as they migrate from their summer to their winter home and to observe their manner of life. This work includes the collection of fish, mud and shells from a depth of 27,000 feet to the surface. The ingenuity of the scientists and navigators has resorted to the employment of electric light at great depths, in order to attract heretofore unknown and otherwise unobtainable fish into the trawl which is let down from the ship's side.

—The fastest run across the continent was that of the Jurrett & Palmer special theatrical train, which in June, 1876, ran from Jersey City to Oakland, Cal., in three days, eleven hours, thirty minutes and sixteen seconds. The distance was 3301 miles. On Nov. 14, 1889, a new regular fast mail train left the Grand Central depot in New York at 9 P. M., and reached San Francisco in four days, twelve hours, forty-five minutes. In October, 1891, John W. Mackay and Miss Virginia Fair crossed the continent in a special car attached to regular trains in four days, twelve hours, twenty-eight minutes. On October 29, 1891, James L. Flood performed the same journey in four days, twelve hours, fifteen minutes.

—The commission of seven engineers appointed by the Mexican Department of Communications to inspect the terminal points of the Tehuantepec railway have compiled their report. They suggest jetties to deepen the bar at the Coatzacoalcos river at a cost of $4,000,000 and for Salina Cruz a system of breakwaters costing $7,000,000. Plans are also submitted for land-locked harbors at Juchitan lake, thirty kilometers south of Salina Cruz, as preferable to breakwaters at that point. The cost of converting the lake into a harbor, excavating a canal from the ocean to it, is ten millions. The Government will soon decide whether it will give out the work to contractors or do it itself. Many American and English contractors are ready to put in bids.

—California and coast manufacturers and producers do not generally appreciate the wealth of the Central American republics and the opportunities there for business. The republics are all prosperous and greatly prefer to do business with the United States; they like American goods best. The greatest obstacle in the way of our people doing business with Central American republics is the manner in which goods are packed. Freight taken from here is unloaded on the open ocean in launches from which it has to be hoisted onto piers and from the pier it is taken to some central town in the interior on pack mules or in ox carts. And unless goods are packed in strong cases, burlapped and strapped with iron, a large percentage of them are likely to be lost or stolen. Goods enter the customs house with the full weight marked on the package, and the full customs rate has to be paid, even if there is only one-tenth of the goods left in the package. Europeans understand packing thoroughly. A package shipped by an English firm, for example, can be rolled down the side of a mountain and it would not be injured a particle, even if it contained glass. If California shippers will give proper attention to this matter of packing their goods, they can have all the business they want with Central America. Another obstacle with which the shippers of the United States have to contend is that their representatives in the republics cannot speak Spanish, and that is a very necessary thing. The representatives there of English, German and French houses speak Spanish like the natives, and that gives them a great advantage. The people down there prefer to deal with the United States, but our merchants do not cater to their trade. Dry goods, for instance, are packed so carelessly that they are usually ruined or stolen while they are being handled there. The people down there will pay for anything they want. Price don't cut any figure. They have got the money, but the shippers of this country will not learn what the Central American people want. American tailors and cutters could make a good thing there. Natives can do the sewing, but they know nothing about cutting out a suit of clothes. As to shoes: Boston-made shoes are shipped to Germany and England, repacked there, and shipped to Central American ports and sold there for less than in the United States. There is an excellent market for cotton prints, but the same difficulty comes in here—Americans will not cater to the market. The bolts of cloth shipped from the United States are considerably shorter than those shipped from Europe, and as a result, when a woman buys a bolt of European cloth, no matter what the price, she sees the bolt is longer and that settles it; she thinks she is getting more cloth for her money.

Cyanide Patent Claims.

P. George Gow, local manager of the Gold and Silver Extraction Co. of America, L'td, has a cablegram from Glasgow which says:

"To-day, after strong opposition and full discussion, amendment to British patent has been allowed exactly as claimed. This confirms British patent and makes position very strong."

This is virtually a victory for the patentees, and will of course strengthen their case in this country and elsewhere.

In handing down the opinion, it was held that "in substance the invention consists not merely in discovering that a dilute solution of cyanide of potassium could be used to extract gold from its ore, but showing the country the best practical method of doing it by leaving baser metals behind, which had never occurred to any one before.

"None of the voluminous evidence introduced served to show that the patents had been anticipated by prior publication nor that any commercial result had ever been attained until Messrs. MacArthur and Forrest proved the commercial value of this discovery.

"The testimony taken in Denver and Salt Lake by the Commissioner appointed by the High Court of the South African Republic resulted in proving that the use of cyanide to extract the precious metals from their ores was unknown in the United States prior to 1890."

In the Right Direction.

To the Editor:—As yet the wealth of California (enough to pay off the debt of the world) lies dormant in its sulphurets or so-called base ore mines—too low grade to pay cost of shipping and treating at the various points where such work is done and yield a profit to the owner.

Any means—metallurgical, chemical, mechanical or electrolytic—which will free the gold and silver from these base encasings quickly and cheaply at the mine is what is most needed here to-day, and he that accomplishes such a feat will be rewarded not only by the best of friends (money), but with the blessings of the whole fraternity and the world at large. Every one engaged in mining knows the infinite need of some means to this end. Yet we speak lightly of "processes," while they are the only sources we have to look to for the solution of this problem; and why not here as well as in South Africa, where cyanide and other processes at the bottom of the great English speculative boom have caused an increased gold production to $40,000,000 this year in place of $6,000,000 five years ago?

Therefore, I for one am ready to hail with encouragement anything in this direction, knowing it will also be accomplished here sooner or later by some one, and I deplore the man who cavils at all such worthy efforts.

Yesterday I visited the works of Mr. W. L. Brown at 710 Capp street, San Francisco, who for three years has been working to disintegrate sulphuretted ores and at the same time separate, set free and amalgamate upon plates the gold and silver contained—all without heat. I found his process a very simple mechanical, chemical and electrolytical one, and also that it did accomplish the dissolution of sulphurets and amalgamated the gold and silver from two pounds of very base tailings, which I took with me, in one hour's time to my satisfaction.

His company may contract to put up a plant for the treatment of twenty-four tons a day at the Kennedy mining district for the Nevada Era Gold Mining Co., Humboldt county, Nevada, giving a guarantee to save and amalgamate 90 per cent of the assay value of their $10 ore, containing antimony, copper, iron, lead and zinc, at a cost not exceeding 90 cents per ton. This ore is absolutely non-amalgable otherwise, and the mine is worthless as it is. This plant would cost $10,000, and, if contracted for, would be in operation within sixty days, no royalty to be charged at any time to others.

I learned that Mr. Lane of the Utica mine felt sufficiently interested, after having visited these works, to send Mr. Brown 1000 pounds of that ore to treat, also that other equally responsible mining men are very favorably impressed with Mr. Brown and his process. Hence, I do not feel that my time or good-will have been spent in vain; and knowing the progressive sympathy of the Mining and Scientific Press for all good things, I beg to draw your future attention to the further practical demonstrations to follow on a commercial scale at the mine and to add that, while this road has been hard traveled by thousands of able philosophers, Mr. Brown has my prayers and belief, judging from results so far, that he will reach this much desired goal.

A. H. Jocelyn,
"N. Y. Daily Financial News."

A report was published recently to the effect that certain employes of the Carnegie Steel Company had discovered a process for welding copper to iron or steel, and the statement was made that the Carnegie Steel Company had paid a handsome sum to the inventors for the right to use it. This statement had been denied by the officials of the company.

Prices for incandescent lamps are now the lowest ever known, ranging from 22 cents down to 14 cents, with a rebate for returned bases.

Scientific Progress.

Huxley's Philosophy.

The late Prof. Huxley, who has been credited with inventing the word "agnostic," and who was an agnostic in belief and practice, did not believe, with Descartes, that brutes are unconscious machines, but that they and men are more or less conscious sensitive automata—a position he fortified, as Maudsley and other recent physiologists have done, by instances drawn from pathological states.

This theory put in the form of theses is thus expressed:

1. There can be no sensation without consciousness.
2. There can be no consciousness without co-operation of the brain.
3. Sensation and consciousness are in some inexplicable way caused by molecular changes in the brain, following upon these as one event follows another, the casual link between motion and sensation being a mystery.
4. All actions which take place unconsciously are reflex, and reflex actions are the operation of an insentient mechanism; they are therefore as purely mechanical as those of automata.
5. The animal body is a reflex mechanism. Even when the brain co-operates with the other centers and produces, this product is not an agent in determining action; it is a collateral result of the operation.

The fifth theses is plainly hypothetical and inadequate as a statement of all that the body is, or at least it depends upon and is an expression of the celebrated "reflex theory" in physiology.

As to the human body, Professor Huxley expressed his belief thus:

"I hold, with the materialists, that the human body, like all living bodies, is a machine, all the operations of which will, sooner or later, be explained on physical principles. I believe that we shall, sooner or later, arrive at a mechanical equivalent of consciousness, just as we have arrived at a mechanical equivalent of heat.

"If a pound weight falling through a distance of a foot gives rise to a definite amount of heat, which may properly be said to be its equivalent, the same pound weight falling through a foot on a man's hand gives rise to a definite amount of feeling, which might with equal propriety be said to be its equivalent in consciousness. And as we already know that there is a certain parity between the intensity of a pain and the strength of one's desire to get rid of that pain; and, secondly, that there is a certain correspondence between the intensity of the heat or mechanical violence, which gives rise to the pain, and the pain itself, the possibility of the establishment of a correlation between mechanical force and volition becomes apparent.

"And the same conclusion is suggested by the fact that, within certain limits, the intensity of the mechanical force we exert is proportioned to the intensity of our desire to exert it."

And he protests that if some great power would agree to make him always think what is true, and do what is right, on condition of being turned into a sort of clock and wound up every morning before he should get out of bed, he would instantly close with the offer. He declared:

"The only freedom I care about is the freedom to do right. The freedom to do wrong I am ready to part with on the cheapest terms to any one who will take it of me."

Prof. Wiley says that "one of the grandest discoveries of modern science" is the agency of the microbes in enabling plants to absorb from the air the nitrogen which is the chief factor of their growth. The theory was first suggested by Pasteur, and it is thought to be fully confirmed by the researches of independent investigators. If it does not deceive expectation it will completely revolutionize agriculture. To increase the growth of plants it will only be necessary to feed their roots with water containing the proper microbes.

A simplified process for silvering glass is thus described by M. M. Auguste and Louis Lumiere, in the *Journal De Physique*. Take 100 parts by volume of a ten per cent solution of nitrate of silver, and add, drop by drop, a quantity of ammonia, just sufficient to dissolve the precipitate formed, avoiding any excess of ammonia. Make up the volume of the solution to ten times the amount by adding distilled water. The reducing solution used is the formalbehyde of commerce. The forty per cent of solution is diluted to a one per cent solution. The glass to be silvered is polished with chamois leather, and the bath is made up immediately before use by mixing two parts by volume of the silver solution with one of formalhehyde. The solution must be poured over the surface without stoppiug. After the lapse of five or ten minutes, at a temperature between 15° and 19° C., all the silver in the solution will be found to have been deposited on the glass in a bright layer, which is then washed in ruuning water. It is then varnished, if the glass side is to be used, or polished if the free surface is required for reflection. The method does not require the scrupulous care necessary with other methods.

Professor Spencer, in a paper read hy him at Brooklyn, reckons the age of the Niagara Falls to be 31,000 years. Hitherto the conjectures as to the age have been based on the observed rate of recession alone, but Professor Spencer takes into consideration also the changing conditions of erosion during the periods or "episodes" of the river's history. He believes the river itself came into existence 32,000 years ago; that it drained the Erie basin for 1000 years without a cascade, and that as the Ontario basin slowly sank the falls were made, until the total descent was 424 feet. He thinks it probable that the falls will last another 5000 years, and that their end will not necessarily be effected by the river cutting its way back to Buffalo, hut rather by changes in its basin, which will turn the draining of the upper lakes into the Mississippi.

An instrument has been invented which enables the condition of the atmosphere in a room to be readily seen. It is called the kinoscope, and measures the amount of impurities which any given volume of air contains. Everyhody is familiar with the blue tinge which distance lends to far-off objects. This is due to the dust and impurities in the atmosphere between the ohserver and the object. The kinoscope consists of a metallic tube terminated at either end by a glass chamber. At one end is a pump which exhausts the air from the tube, and at the other a faucet which allows the air of the room to be tested to be drawn in. Some damp white blotting paper is placed in the tuhe, and by means of diffracting lenses the tint of the air is thrown onto the blotting paper. The strength of the blue tinge denotes the condition of the air.

Director Holden, of Lick Observatory, writes that before the art of photographing the moon can be carried to greater success there must be plates of greater sensitiveness and finer grain. Now the photograph of a volcanic crater on the moon's surface will appear like a grain of the silver on the plate unless the crater is over a tenth of a mile in diameter.

The Director of the Lick Ohservatory is notified by telegraph of the discovery of a faint comet by Dr. Lewis Swift, at Echo Mountain, Cal., on Aug. 20. At 14 hours 0 minutes, local time, its position was R. A. 0 hours 27 minutes 40 seconds; and Dec. north 5 degrees 30 minutes. Its motions were northeast.

A Swiss Scientist has been testing the presence of bacteria in the mountain air, and finds that not a single microbe exists above an altitude of 2000 feet.

Mechanical Progress.

Notes About Belts and Belting.

A lecturer before the Chicago Engineers' Association says:

All belts should be pliable, with close texture, smooth and solid surfaces, as well as uniform thickness, and they should never contain split leather.

Leather belts are used for transmitting power in preference to gearing, because they are more readily connected, have quiet motion, are lighter than cog gearing, produce less wear and tear to machinery, and unquestionably cause fewer accidents.

Textile strength of belting varies to a considerable extent; hence care must be taken in selection of leather. Only center cuts from the center of the hide should be used; they are firmer, better filled and show the least stretch. Other parts from the hide have longer fibers and are stronger, but they are spongy and will wear in a curved condition. In other words, straight running belts cannot be made from the shoulder. Every responsible belt manufacturer knows what stock goes into his belts.

The fiber of the hide is its main strength and of the belt its main strength. Care must he exercised in tanning the skin so that the change from raw hide to leather is performed without injury to the fiber. Chemicals destroy these conditions and often burn the fibers. Oak-tanned or union-tanned stock is what makes a good belting. Purchase your belts from a recognized reputable manufacturer, who aims at perfection and caters to the consumiug trade in preference to the jobbing trade.

Manufacturers who make a specialty of furnishing "short lap" belts are the true friends of the consumers of belting. A "short lap" contains only that part of the hide which is in the center. Each piece is from 4 feet to 4 feet 6 iuches long by 14 to 18 inches iu width. It does not contain any soft, spongy or very stretchy part. The stretch, which varies from 3½ to 6 inches per strip of 4½ feet, is well worked out of each strip before it is joined or made up into the roll. Such oak-tanned manufactured helting will have uniformity iu weight, stretch, density and thickuess.

You cau always tell when the shoulders have been used in a belt by the uumerous creases on the surface and tendency of helt to curve while running on the pulleys; besides, the leather is of a loose, spongy nature. A cheap belt is always costly and will never fail to give trouhle, while a first-class short-lap belt will run for a long time without auy signs of crankiness. The grain or hair side of the helt is the weakest; it cracks more readily than the flesh side. It should be placed next to the pulleys for the above reason and because it clings more tenaciously to the pulleys, due to its smooth, close surface.

The whole question of driving power by belt transmission is based upon the speed at which they are driven. There is scarcely any limit to the life of a well-constructed and running belt, provided it is properly placed and looked after.

It is hard to state what width, thickness and length should govern the purchase and use of a belt for a given number of H. P. because there are many conditions bearing upon the subject. Increased pulley surface quickens the drive. Sbafts of pulleys sbould be perfectly parallel and the pulleys true and concentric.

Pulleys should he placed at certain distances from each other, about as follows: Small pulleys, about 15 feet apart; larger, 20 to 25 feet apart; very large, 25 to 30 feet apart.

Pulleys should be as large as possible—not much wider than the belt—and their speed should not exceed much more than 3000 feet of belt motion per minute. The diameter of pulley can he determined by the number of revolutions that is made by the shaft.

The speed of belt is not very hard

upon itself, hut it is greatly injured hy running over a small pulley, strapping tight at high speed. When a given amount of power is required, the smaller the pulley the tighter must be the helt in all cases.

Theory Alone Insufficient.

Talking of "the profession of electricity," C. H. Summers, electrician of the Western Union Company, at Chicago, says:

"Too many young men go into the business who are not fitted for it. They either start out fresh from school, filled with the idea that they can enlighten the world, or they are urged to go into the business by friends who think the electrical field a great one for a young man to enter. The young man himself wants to accomplish something without spending too much time and energy, and his friends urge him to secure a position which seems to offer advantages which no other does.

"The trouble with young men when they graduate, is not that they don't know enough, hut that they know too much, theoretically, and theory doesn't go in business. Practical electricians want practical men, and the only thing for the young man fresh from school to do is to throw off his coat and go to work. He must not only know why certain things are done, but he must know how to do them. He must have good, hard sense and know what to do when thrown on his own responsiblity. But the trouble is the boys get discouraged at the start. They have expectations, and when they are asked to work for $40 a month, to hegin with, they usually get tired and quit.

"A man to make a success of electrical engineering must first have a taste for the work and for electrical development; certainly he ueeds a common school education, and above all he must excel in mathematics. You can easily see why this last is so essential. A man might experiment forever and he eminently successful hut if he could not demonstrate satisfactorily why such things were practicahle he would never interest anyone, much less get anyone to invest money. No one man can cover the whole field. Electricity might he compared to the field of medicine. It is classified into specialties, and as there is in medicine oculists, physicians, surgeous, etc., so there are in the electrical business telegraph men, telephone men, electric light men, and power men. Each one covers his own particular field hut keeps track of the others only in a general way."

THE Chicago Hard Copper Company is reported to be turning out a commercial product of hard copper castings. The process consists in treating the molten copper with a chemical compound whose ingredients are uot disclosed, hut which the inventor states is not an alloy, heing introduced for its effect in rearranging the molecules of the metal. Fractures of the treated metal exhihit no indication of an alloy, hut show all the characteristics of pure copper. The castings are very smooth and free from hlow-holes. Remarkahle specimens are shown of tough castings, such as chain links which have heen suhjected to severe torsional tests without injury, inch-square hars which have stretched 3½ inches before being hroken in a testiug machine, etc. Cast hars of the treated metal have heen drawn into wire of high quality and rolled cold into thin strips of great tenacity and perfect surface. The inventor states that the cost of the treatment given is but trifling, amounting to ahout 60 cents per ton of copper castings. After the molten copper has heen treated, it is stated that it can he cast in ingots and set aside for making castings suhsequently without losing its peculiar property.

THE largest belt in the world has recently heen made by the Jewell Belting Company, of Hartford, for the Washburn & Moen Manufacturing Company. It is 118 feet long, 78 inches wide, and is four ply. It took the hides of 100 steers to make it.

Electrical Progress.

Electric Propulsion for Steamships.

The recent alliance between the Baldwin Locomotive Works and the Westinghouse Electric and Manufacturing Company has started a great deal of talk, sensihle and otherwise, ahout the substitution of electricity for steam on railroads. The idea that the same change might he effected advantageously on the great vessels which cross the ocean was suggested to C. H. Cramp, who replied that no conspicuous shipbuilder would think of such a thing for a moment. It was more economical to apply the power of the eugine on a steamship directly to the service than to convert it first iuto electricity and then use the latter to do the work.

This was a thing which any electrical engineer could have told the enquirer. Small launches can he propelled hy electric power which has previously heen stored in accumulators on land and transferred to the hoats; but the supply of energy is sufficient to last only a few hours, and then the exhausted battery is lifted out to he freshly charged, and new cells are put in its place. An ocean-going vessel cannot return to port every three or four hours, and, as at present constructed, a storage hattery capacious enough to hold the electricity which would he required iu taking an ordiuary steamship from here to Honolulu would weigh more than the whole ship. This phase of the suhject was not discussed hy Mr. Cramp, who considered only the idea of generating the current on shiphoard, hut to both schemes would equally apply his emphatic statement: "The application of electricity to the propulsiou of ocean steamships is practicahly impossihle."

Some New Uses of Electricity.

Calcic carhide, from which the new gas acetylene is made, is produced electrically by means of the arc in a furnace, and one ton, yielding ahout 11,000 cuhic feet, can he made for $20, while the quality is such that five cuhic feet per hour give a light of 240-candle power. "Electric sugar" is a phrase that has lingering odors of fraud around it, yet, as a matter of fact, one electrical horse power will refine daily the syrup from at least 100 tons of heet root, and several German factories treat their heet syrup electrically. In the manufacture of safety matches ahout 2000 tons of potassium chlorate are used annually, and nearly the whole of this is now produced electrolytically. One plant in the Jura mountains of 2000-horse power turns out 600 tons, and there is a larger plant in Dalecarlia of 6500-horse power. The use of the current is also extensive in the production of aniline dyes, and the electrical method is rapidly superseding all others in the production of chloroform. To the list of novelties may he added caustic soda, electrozone, hydrocyanic acid, and as in each case cheap electric current in large quantities is a desideratum, our big American central stations are interested in such developments. A considerahle propoution of the power from Niagara is already taken up hy factories producing aluminum and carhorundum with the aid of electricity.

I HAVE heard a friend of mine, president of one of the large lighting companies, remark that his superintendent's head was not the right shape. I am not sure that he should blame the superintendent for this. Really good men cannot he retained for the wages that every Tom, Dick or Harry that comes along may he willing to work for, and a good man can usually save his salary if given a fair opportunity. Don't make machiues out of your men. The interests are too variahle for this to prove successful. Put some responsihility on them. Make them feel an interest in the results, and better still, if you have a proper system of operating your business, you can provide for a premium plan on operation that will actually give the men an interest and at the same time tend greatly to your own benefit in the economical operation of your station.—J. S. Stephens, before the Northwestern Electrical Association.

Sacramento's Electric Carnival.

On July 13th electric power was received at the sub-station of the Sacramento Electric Power and Light Company in Sacramento City from the great works of the company, twenty-two miles away, near the town of Folsom. At that point a massive stone dam, making a fall of eighty feet, has been built across the American river, a torrential stream, just as it emerges from the foothills of the western slope of the Sierra Nevada.

The power developed, as it is delivered, is 4000-horse power. This is capahle of indefinite increase as the demand for electricity for light or power may require.

On Septemher 9th Sacramento will celehrate the installation of this great work hy an electric carnival, in which the Native Sons of the Golden West of California, to the estimated number of 10,000 will join. Sacramento invites all the people everywhere to witness this spectacle, aud unite with her in celehrating a triumph of energy, enterprise and progress.

Practical Information.

A New Species of Bear.

A bear that seems to he certainly a new variety, and is regarded hy some as a distinct species, is reported from Alaska, where it frequents the vicinity of the Mount St. Elias glaciers. It is of moderate size and is thus described hy W. H. Dall, the naturalist:

"The general color of the animal resemhles that of a silver fox. The fur is not very long, hut remarkahly soft and with a rich under-fur of a hluish-hlack shade, numhers of the longer hairs being white, or having the distal half white and the hastal part slaty. The dorsal line from the tip of the nose to the rump, the hack of the very short ears, and the outer faces of the limhs, are jet hlack. Numerous long white hairs issue from the ears; black and silver is the prevalent pelage of the sides, neck and rump; the under surface of the helly and the sinuses hehind the limhs are grayish-white, or even nearly pure white, I am told, in some cases. The sides of the muzzle and the lower anterior part of the cheeks are of a hright tan color—a character I have not seen in any other American bear, and this character is said to he invariahle. There is no tint of brown elsewhere in the pelage. There is no tail visihle on the pelts. The claws are small, very much curved, sharp, hlack ahove and lighter helow; the animal evidently can climh trees, which the browu bear cannot do.

"This hear is knowu to range ahout the St. Elias glaciers, especially near Yakutat, and a single specimen has heen killed on the mountains as far east as Juneau. About thirty-five skins have heen hrought to Sitka, mostly from Yakutat. A mounted skin, the only one known as yet (said to contaiu the skull) is in the possession of F. A. Bartlett, of Port Townsend, Wash."

How Mineral Wool Is Made.

Of those who know what mineral wool is, or silicate cotton, as it is sometimes called, prohahly only a small number are familiar with the simple process hy which it is made. The wool itself, serving a variety of useful purposes, as a non-conducting covering against heat and cold alike, for steam pipes and cold storage room walls, as a sound "deadener" in floors of buildings and as a means of fireproofing, among many others, is, as its name implies, a soft and woolly suhstance, consisting of a mass of very fine mineral fihers interlacing one another in every direction, and thus formiug an endless number of minute air cells. The wool appears on the market in a variety of colors, principally white, hut often yellow or gray, aud occasionally quite dark, and is made by converting scorial and certain rocks while in a molten state into a fibrous condition hy a steam hlast directed against the liquid material. Blast furuace slag forms the raw material for one variety of the wool, and sandstone for another, yielding respectively slag wool and rock wool, the latter heing preferahle for pipe covering because of the ahsence from it of sulphur, which, with moisture present, becomes an active eorroding agent. The furnace slag or the rock, as the case may be, is melted in a large cupola, and as it trickles out at the tap-hole in a somewhat sluggish stream it meets a high-pressure steam jet which atomizes the woolen mineral, if it may he so termed, hlowing it iu fleecy clouds into the storage room provided for it. Soft and downy, the stuff settles wherever a resting place affords itself, the heavier and easier wool coming down first, while the lighter portions are hlowu farther along hy the force of the steam and settle in the more distant parts of the room, the material thus naturally grading itself into varieties of different quality. A thousand pounds of wool per hour are turned out hy one of the cupolas, and after the storage room has heen blown full the flocculent mass is pushed into hags, ready for the market. The whole process affords an admirahle and interesting illustration of the utilization of an utterly waste product.—Cassier's Magazine for Septemher.

The Largest River.

The largest river of any age of which there is any evidence in the world, according to a remarkahle geological discovery reported to the Royal Society of Canada, at its late meeting at Ottawa, was a great preglacial river in northern Canada. Dr. Robert Bell, who produced scientific evidence of the correctness of his discovery, pointing out that it was generally admitted hy geologists that the continent of North America, immediately hefore the glacial period, stood at a much higher elevation than at the present time, amounting to perhaps, between two and three thousand feet. The incvitable result of this must have heen to change the river systems from what they now are, and to create in the north a gigantic river, draining an area of over one-third of the entire continent of North America and forming a drainage hasin seven times as large as that of the St. Lawrence.

The central portion of the great river was in the middle of what is now Hudson hay, as proved hy the existing depressions of land in the north of Canada and the great depth of the center of Hudson hay. Its lower part discharged through what is now Hudson straits, into Davis straits. It is also maintained that the upper half of the St. Lawrence hasin, hoth in preglacial times and also at a later geological period, discharged its waters northward hy way of what is now Hudson hay. It is asserted that this constituted one of the main branches of this great northern river. Other hranches were the present Saskatchewan, the Nelson river, which rises west of the Rocky mountaius, the Churchill, largely augmented by the reversal of some of the upper rivers of the Mackenzie hasin, and great tributary streams that come down the present Churchill inlet, Fox channel, and Ungave hay, any one of which must have fully equalled in size the Mississippi of our own day.

ONE of the most remarkahle features of earthquake pulsations is their great duration. The originating earthquakc may last but a few seconds, while the ground at a distance may rock gently through a small angle for hours.

LAKE SUPERIOR is in danger of losing its distinction of being the largest fresh-water lake in the world. African explorers hegin to think Lake Victoria Nyanza is larger.

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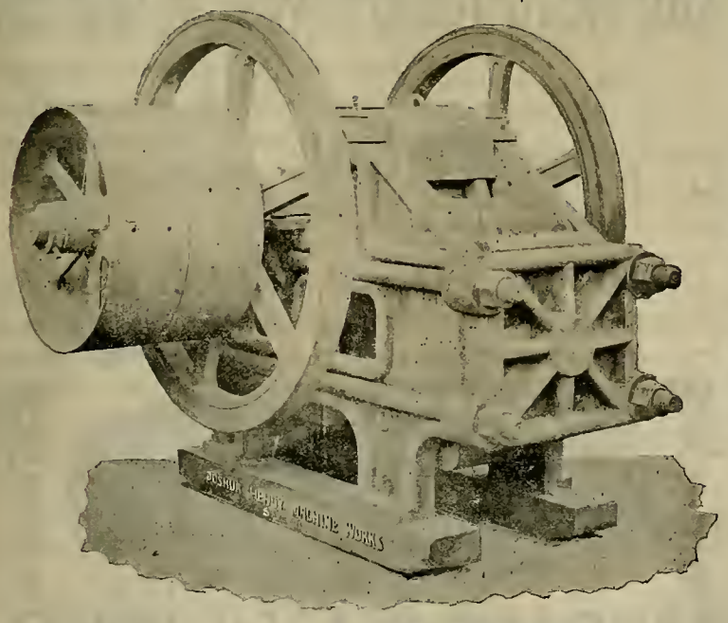
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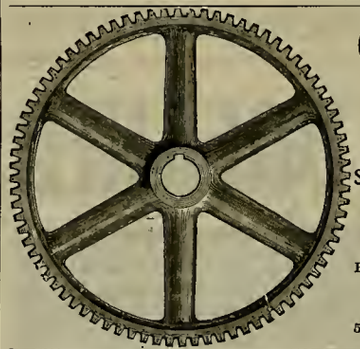
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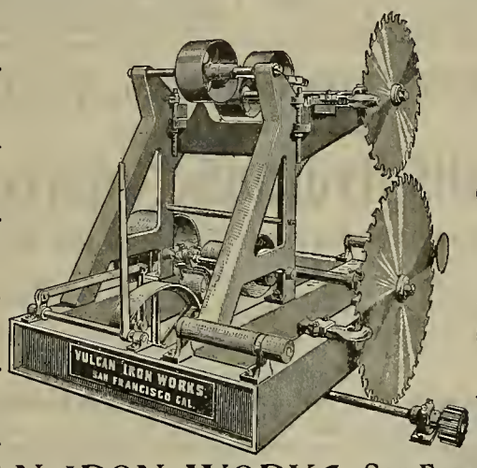
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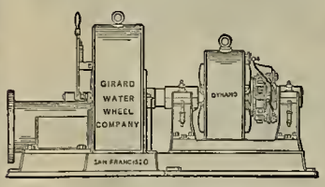
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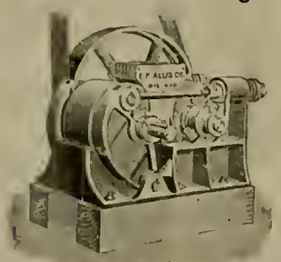
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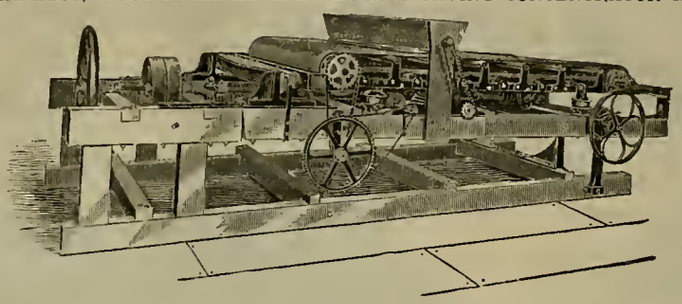
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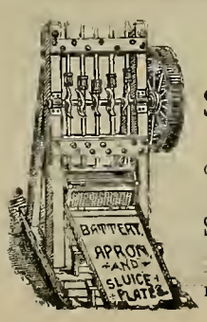
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Market Reports.

The Markets.

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Silver varies little in price. The chief attention continues centered in copper. The advance of electrical development has largely increased the demand for copper wire. In December of last year lake ingot copper sold at 9¼ cents a pound. Our New York quotations to-day are 12¼, and there are predictions of a further advance. It is said that copper can be mined and sold in New York at 6 cents a pound.

The Calumet & Hecla Copper Company of Michigan is reported to have made a sale at 12c for delivery up to Novemher 30th of 10,000,000 pounds. Copper was £47 on the 20th, an advance of 5s in three days.

Forty million pounds of copper is the reported annual product of the Boston & Montana mine. It is laid down in New York at a cost of 6 cents per pound. With 12 cents for electrolytic copper, this would make 6 cents per pound profit and annual earnings of $2,400,000, equivalent to 9 per cent on Boston & Montana stock if hought at $150 per share. But the output can he increased easily to 60,000,000 pounds per annum and with continued demand the temptation will he strong to increase it. This would add another million dollars to Boston & Montana earnings.

As to iron and steel, the Cleveland correspondent of the *Iron Age* of New York recently embodied the following in his market report: "The steel market is in a condition that hrings joy to the heart of the manufacturer. Buyers only ask to be protected in their purchases. 'An old maid book agent could sell steel to-day,' said the agent of a leading concern, Tuesday. 'The market is in a splendid condition; workingmen and their employers are near together and wages are going to he hetter a little later on.'"

New York Metal Market.

NEW YORK, Aug. 29.—PIG IRON—Southern, 11@14c; Northern, 12@14c.

COPPER — Brokers', 12.40 @ 12.50c; exchange, 12.20@12.25c.

LEAD—Brokers', $3.35; exchange, $3.60.

TIN—Straits, 14.40@14.55c.

SPELTER—Domestic, $4.20.

New York Silver Prices.

NEW YORK, Aug. 29.—Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.
Friday	30⅝	66⅝	11 80	.....
Saturday	30½	66⅜	11 85	3 37½
Monday	30½	66¾	.....	3 37½
Tuesday	30½	66¾	.....	.....
Wednesday	30⅝	86⅝	11 95	3 40
Thursday	30⅞	67	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, ¾ per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½@
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.89
London Merchants	$4.87½
London Sight Bankers	$4.90
Refined Silver, per ounce	87c
Mexican Dollars, nominal	54c

San Francisco Metal Market.

COPPER.			
Bolt	¼ & 5-16, 18c; ⅜ and larger, 18c		
Lake Superior Sheathing	20	@	—
Ingot, jobbing	—	@	18
Ingot, wholesale	15	@	14
Sheet copper	—	@	19
ZINC.			
Sheet	9	@	
LEAD.			
Pig	—	@	4 00
Bar	—	@	4 10
Sheet	—	@	5 35
Pipe	—	@	4 85
SHOT.			
Drop, sizes *smaller* than B, per hag of 25 lhs			$1 20
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do, "		"	1 45
IRON.			
American Soft	15 00	@	17 00
Pig, per ton	16 00	@	19 00
STEEL.			
English, lh	15	@	17
ANTIMONY.			
Per lh	—	@	10
PIG TIN.			
Per lh	15	@	18 00
QUICKSILVER.			
Home trade, per flask	41 00	@	— —
TIN PLATE.			
Per hx	5 25	@	6 00
ZINC.			
Sheet	8¼	@	
BORAX.			
Refined, in car lots	—	@	5½
Refined, in sacks and barrels	—	@	5⅝
Powdered, in car lots	—	@	5⅝
Concentrated, "	—	@	4⅞
COAL.			
SPOT FROM YARD—PER TON.			
Wellington	$ 8 00		
Greta	7 00		
Nanaimo	6 50		
Gilman	6 00		
Seattle	8 50		
Coos Bay	5 00		
Cannel	8 00		
Egg, hard	12 50		
Walisend	7 00		
Scotch Splint	7 50		
Brymho	7 50		
TO ARRIVE—CARGO LOTS.			
Australian	5 50	@	— —
Liverpool Steam	8 00	@	— —
Scotch Splint	8 50	@	— —
Cardiff	8 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'	75c	@	hhl
English, to load	9 00	@	10 00
" spot, in hulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Belcher S M Co., Nev	51	25c	July 16, Aug 20, Sept 10	C L Perkins, Mills Building
Bodie Con M Co, Cal	18	15c	Aug 13, Sep 16, Oct 7	M E Willis, 309 Montgomery
Con Imperial, Nev	36	1c	Aug 5, Sept 12, Oct 3	C L McCoy, Mills Building
Evening Star M Co, Cal	19	1c	Aug 5, Sept 10, Sept 22	J J Scoville, 320 Sansome
Kentuck Con, Nev	11	10c	Aug 6, Sept 10, Oct 1	Aug Waterman, 309 Montgomery
Mono M Co, Cal	35	10c	July 16, Aug 15, Sept 10	M E Willis, 309 Montgomery
Ophir S M Co, Nev	66	25c	July 11, Aug 13, Sept 2	E B Holmes, 309 Montgomery
Potosi M Co, Nev	44	25c	July 14, Aug 14, Sept 4	C E Elliott, 309 Montgomery
Sierra Nevada S M Co, Nev	109	25c	July 30, Aug 30, Sept 23	E L Parker, 309 Montgomery

NAILS.

Wire	$2 30
Cut	2 00

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, August 29, 1895.

Stocks were slow in the early part of the week, particularly the Middle group, but improved considerably since Wednesday, Challenge, Confidence, Crown Point, California, Norcross, Chollar, Belcher, Potosi, Curry, Union, Ophir, Savage, Jacket, Occidental, Nevada, Andes, Bullion and Alta all advancing. Exploration work west on the 1100-foot level on tbe Con. Va. is being pushed. The three inclines will have sufficient depth hy the 15th prox. to admit of crosscutting on the Brunswick vein. Messrs. Lyman and Messer were on the Comstock during the week looking at the Concordia and Monte Cristo claims on the Brunswick, which the Ophir and Mexican think of huying, and made a report thereon, which will he considered hy the directors at their next meeting.

The following illustrates the changes of the week:

Mines.	Aug. 22	Aug. 29
Alpha	.....	$ 10
Alta Consolidated	$ 10	14
Andes	28	33
Belcher	60	57
Best & Belcher	1 10	1 05
Bodie	10	15
Bullion	.....	.....
Challenge	40	63
Chollar	59	62
Confidence	1 20	1 85
Consolidated California and Virginia	2 75	2 80
Consolidated New York	.....	.....
Crown Point	55	54
Exchequer	.....	02
Gould & Curry	58	55
Hale & Norcross	1 80	1 80
Justice	07	07
Mexican	68	63
Ophir	1 55	1 60
Overman	19	20
Potosi	58	85
Savage	36	45
Sierra Nevada	42	45
Union	48	53
Utah	.....	07
Yellow Jacket	39	43

San Francisco Stock Board Sales.

SAN FRANCISCO, August 29, 1895.

9:30 A. M. SESSION.

500	Alta	14	500	Exchequer	02
200	Belcher	56	100	Gould & Curry	51
100	Best & Belcher	1 60	350	H & N	1 75
100		1 05	400	Kentuck	02
300	Challenge	62	200	Mexican	63
200	Chollar	59	150	Ophir	1 55
100	C. C. & Va	2 80	200	Savage	39
100		2 75	100	S B & M	11
400	Confidence	1 80	100	Sierra Nevada	43
40		1 70	100	Union	49
500	Con. Imperial	01	300		50
100	Crown Point	51			

SECOND SESSION—2:30 P. M.

100	Ophir	1 60	400	Sierra Nevada	45
50	G. & C	55	200	Utah	07
200	Best & Belcher	1 00	200	Overman	20
500	Savage	45	600	Justice	07
100	Chollar	62	300	Union	53
500	Potosi	65	100	Alta	14
200	Hale & Norcross	1 80	100	Caledonia	18
200	Crown Point	54	200		16
100	Yellow Jacket	42	100	Challenge	63
200		43	700		62
100	Kentuck	02	200	Occidental	31
200	Alpha	10	50		30
200	Belcher	57	100	Andes	33
100	Confidence	1 85	1100	Bodie	15
200		1 80			

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from W. A. and M. E Schofield, in the King Sayre Mine, near Gibsonville, Sierra Co., to impound tailings in Whiskey Creek; from N. B. Willits and B. Pride, in the Willow Placer Mine, near Sierra City, Sierra Co., to impound tailings on flat ground; from Oliver F. Caya and W. T. Sherman, in the Canada Mine, near Port Wine, Sierra Co., to impound tailings in French Ravine; from H. H. and A. A. Moyer and John Costa, in the Argentine Mine, near Downieville, Sierra Co., to impound tailings in a dry ravine; and from John Pascoe, in the Eureka Hydraulic Mine, near Placerville, El Dorado Co., to impound tailings in Chill Ravine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Sept. 2d, 1895, at 1:30 P. M.

WANTED!

A Gold Quartz or Copper Property,

With sufficient development work done to show up the property. Must stand a thorough and complete examination. None but a first-class property wanted. All information will be strictly confidential with buyer only. Send full particulars of property for sale.

M. KNOX,

12 Front Street.....San Francisco, Cal.

Hydraulic Mine for Sale.

Not on a navigable stream; in northern California. Good dump; no trouble with tailings; 180 acres of mining ground; 5000 inches of water. Can work eight months in the year. Ample opportunity given a buyer to fully test the property before payment is made. For further details,

Address X. 2022 W St., Sacramento, Cal.

Assessment Notices.

KENTUCK CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the sixth day of August, 1895, an assessment (No. 11) of Ten (10c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the tenth day of September, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the first day of October, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

AUG WATERMAN, Secretary.

Office—Room No. 23, Nevada block, No 309 Montgomery street, San Francisco, California.

FAIRFAX VILLA COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Fairfax, Marin County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of August, 1895, an assessment, No. 4, of Fifty Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 56, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of September, 1895, will he delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 21st day of October, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, Room No. 56, No. 309 Montgomery street, San Francisco, California.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 23d day of August, 1895, an assessment, No. 3, of 2½ cents per share was levied upon the whole of the capital stock of the corporation, both paid and unpaid, payable immediately in United States gold coin to the Secretary, at the office of the company, 213 Jackson Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of October, 1895, will he delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 28th day of October, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald, Trustee	295	1,000	100 00
M. J. McDonald, Trustee	296	1,000	100 00
M. J. McDonald, Trustee	298	1,000	100 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	222	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
Mrs. Hattie C. Baggs	529	201	20 10
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
S. H. Barnes, Trustee	289	500	50 00
S. H. Barnes, Trustee	353	154	15 40
Geo. Dillman	530	980	98 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
Israel Luce, Trustee	397	1,000	100 00
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	482	1,250	125 00
W. W. Sargeant, Trustee	485	1,000	100 00
W. W. Sargeant, Trustee	488	745	74 50
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	516	600	60 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
Jos. Rosenthal	489	5	50
Percy Beamish, Trustee	494	500	50 00
Percy Beamish, Trustee	495	225	22 50
H. H. Noble, Trustee	523	4,000	400 00
Montgomery Baggs	528	100	10 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

INVENTORS, Take Notice!

L. PETERSON, MODEL MAKER,

226 MARKET ST., N. E. Corner Front (Up Stairs), SAN FRANCISCO. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential*.

WANTED SITUATION AS BOOKKEEPER and Assayer in mine. A 1 references. Communications confidential.

Address X. Y. Z., This Office.

WIRE ROPE

FOR ALL PURPOSES

WIRE ROPE TRAMWAYS

IRON & STEEL WIRE

TRENTON IRON CO

TRENTON, N. J.

N. Y. OFFICE

COOPER, HEWITT & CO., 17 & 19 BURLING SLIP

CHICAGO OFFICE 114 & 116 MONADNOCK BLOCK

AGENT IN SAN FRANCISCO:

NEWTON M. BELL, 109 California Street.

A Full Assortment of Wire Rope for Mining Purposes carried in San Francisco.

THE GOLD and SILVER EXTRACTION COMPANY, OF AMERICA.

LIMITED.

TRADE MARK.



(MACARTHUR-FORREST PROCESS)

MacArthur-Forrest Process.

CAPITAL, - - £110,000 STERLING.

To MINE OWNERS and others having Refractory Gold and Silver Ores hitherto untreatable at a profit, the MACARTHUR-FORREST (Patent) Process of Gold and Silver Extraction offers a solution of the difficulty.

Advisory Board in the United States: Thomas W. Goad, Manager; Hugh Butler, Attorney; John F. Bell; P. George Gow.

California and Nevada Agency and Experimental Plant, 23 Stevenson Street, San Francisco, Cal. P. G. Gow, Sole Agent.

OFFICE: MCPHEE BUILDING, DENVER, COLORADO.

THE ROESSLER & HASSLACHER CHEMICAL CO.,

73 Pine Street, New York.

CYANIDE

—OF—

POTASSIUM,

Ferricyanide of Potassium,

Peroxide of Sodium,

Hyposulphite of Soda,

Sulphide of Iron,

And other Chemicals for Mining Purposes.

THE ROESSLER & HASSLACHER CHEMICAL COMPANY CHEMISTS NEW YORK

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RUPTURE CURED!

NO DANGER. NO OPERATION. NO PAIN.

No Detention from Business.

QUICKLY! PERFECTLY! PERMANENTLY!

NO PAY UNTIL CURED.

J. C. ANTHONY, M. D.,

San Francisco Offices, Suite 86 and 87, Chronicle Building.

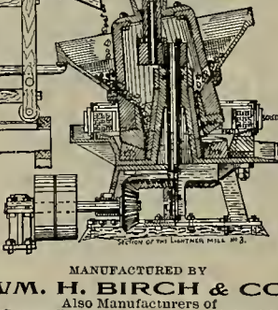
AMERICAN CONDENSED MILK COMPANY

WESTERN AMERICAN 99 BRANDS

SAN FRANCISCO

THE LIGHTNER QUARTZ MILL.

Something New, Good and Cheap.



MANUFACTURED BY

WM. H. BIRCH & CO.

Also Manufacturers of Cary Steam Pumps, All kinds of Mining Machinery, Boilers, Engines, Ore Buckets, Ore Cars, Cages, Hoists, etc.

119 Beale St., San Francisco.

Power Transmission by Compressed Air.

In an article in last week's issue prominent notice was made of the new plant being put on Massachusetts hill, Grass Valley, Cal., for the North Star Mining Co. In connection therewith the Pelton Water Wheel Company have under construction a wheel for that mine of such extraordinary dimensions as to merit a brief description.

The wheel is 18 ft. in diameter, weighs 10,500 lbs., and is to develop 250 H. P., running under 750 ft. head, at 110 revolutions, and is to be directly connected to the shaft of a Rix duplex compressor, compound tandem type, of same capacity.

The design of the wheel is original and wholly novel. From a cast-iron hub radiate 24 steel spokes, which are connected to a rim made up of angle iron properly shaped, having a slot for the buckets, which are bolted to the periphery, the strain being taken by four heavy steel truss rods.

The wheel is made of this large diameter for purpose of giving proper speed to the compressor under the high head available. The water is applied to the wheel through a variable nozzle controlled by an automatic regulator, which will maintain a uniform speed on the wheel, with a variation from full load down to 25 per cent of same, affording by this means the greatest possible economy of water.

The power thus furnished is to be carried to the mine of the North Star Company, some 2000 feet from the power station, to run the hoisting works, mill and other machinery connected with the operations of that company.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING AUGUST 20, 1895.

541,879.—GAS ENGINE AND GENERATOR—D. Best, San Leandro, Cal.
544,880.—GOLD-SAVING DEVICE—Bouk & Bushnell, Santa Cruz, Cal.
544,881.—FRUIT CRATE—C. S. Chamberlain, Oakland, Cal.
545,011.—AMALGAMATOR—G. H. Cbick, S. F.
544,721.—PACKING CANS—J. B. Ciot, S. F.
544,722.—CAN-HEADING MACHINE—J. B. Clot, S. F.
544,886.—PACKING PRESS—Denotovich & Porteous, Fresno, Cal.
544,846.—FOLDING TABLE—V. C. Dodge, Sacramento, Cal.
544,888.—CAR BRAKE—H. Eschweiler, S. F.
544,760.—HAY LOADER—C. Freeman, Inglewood, Cal.
544,669.—CAMERA—E. J. Gregory, Sacramento, Cal.
544,761.—ORE FURNACE—H. P. Holland, S. F.
544,930.—STOPPLE—J. P. Miller, Santa Cruz, Cal.
544,994.—PLOW—A. Pirch, Los Angeles, Cal.
544,939.—SPRAYER—A. G. Provine, Puyallup, Wash.
544,829.—BRIDLE FRONT—O. Ruf, Los Angeles, Cal.
544,937.—BUTTER BOX—R. A. Simpson, Ferndale, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CONTINUOUS FLOW SYRINGE.—Frank Terramorse, San Francisco, Cal. No. 544,014. Dated Aug. 6, 1895. This invention consists of a syringe having a chamber connected with its discharge end and provided with a nozzle whose area is less than the passage through which the liquid enters the chamber. A spring-actuated plunger is fitted into the chamber and has a hollow rod connecting directly with the discharge of the syringe and also with the chamber, so that the plunger will be forced inwardly against the power of its spring by reason of the accumulation of liquid in front of it, while the spring constantly reacts against the plunger and exerts a continuous pressure on the liquid, thus producing a continuous flow from the nozzle.

BICYCLE NAME-PLATE.—Charles W. Vosmer, Oakland, Cal. No. 544,524. Dated Aug. 13, 1895. This invention relates to a name-plate and a convenient means for attaching it to the frame of a bicycle. It consists of a sheet of metal made of any suitable form, preferable longest in the central portion and in the direction of the length of the bar to which it is to be attached. The opposite edges are folded inwardly, approaching each other so that the plate will fit around the desired bar. In conjunction with this is a tapering key having its edges turned inwardly, adapted to interlock with the inwardly turned edges of the plate, and when driven in, it clamps the plate upon the frame so as to hold it firmly in place.

PROCESS AND APPARATUS FOR MAKING GUNPOWDER.—William C. Peyton, Santa Cruz, Cal., assignor to the California Powder Works, San Francisco. No. 544,517. Dated Aug. 13, 1895. This invention relates to the treatment of explosives which, at a certain stage of manufacture, are in a plastic or semi-plastic condition. The object of the invention is to convert this mass into grains or pellets suitable for use in various kinds of fire-arms and cannon. It consists essentially in forming the plastic mass into a tube by forcing it through a hole around a rod or mandrel, then cutting the tube open along one side, parallel with the axis, separating the edges to form the cylinder into a flat sheet, then passing the sheet thus formed between grooved rollers whereby it is cut into parallel strips of geometrical cross-section, with intermediate uniting films, and finally passing it beneath a vertically reciprocating cutter whereby the strips are cut into grains.

PAPER CAN.—Geo. H. Bartlett, San Francisco, Cal. No. 544,525. Dated Aug. 13, 1895. This invention relates to an improved method of manufacturing paper cans. It consists of forming the body of one piece, with the leaking edges joined together along one side by means of U-shaped channel strips, the bases of which abut so that the strips are approximately flush with and form a continuation of the edges, and means for uniting the top and bottom of the can to the body, consisting of thin strips of bendable metal rolled in an S-form in transverse section so as to form oppositely facing channels to receive the end of the can body, while the outer periphery of the metal strip projects upwardly around the outside of the opposite channel to receive the head which rests upon the metal between the two channels, the projecting edge being bent or clamped over the end so as to lock it to the body.

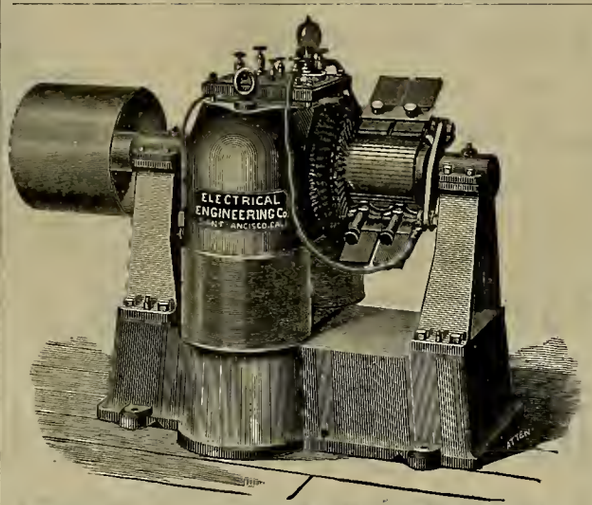
BUTTER BOXES.—R. A. Simpson, Ferndale, Cal. No. 544,997. Dated Aug. 20, 1895. The object of this invention is to provide such an improvement in butter boxes as will dispense with exterior cleats, and will provide a simple, non-projecting fastening for the cover when closed and hinges so constructed that they will not become destroyed by the corrosive action of salt and will have a freedom of motion. It consists of a box having a strap bent at right angles at the upper edge and a cover having a strap extending below its rear edge with a slot in this portion through which the strap upon the box passes, the lower projecting end of the cover strap being movable within the channel or groove formed interior to the strap which is fixed to the box. The fastening device consists of a strap or plate secured to the top of the box, bent at right angles, through the front, having an upturned end and a channel formed in the front of the box into which this end projects when the cover is closed, so that a sliding bar may be driven in to lock the end of the strap, all parts being inside of the outer surface of the box front.

FRASER & CHALMERS
CHICAGO, ILL., U. S. A. and
43 Threadneedle St., E. C., London, Eng.

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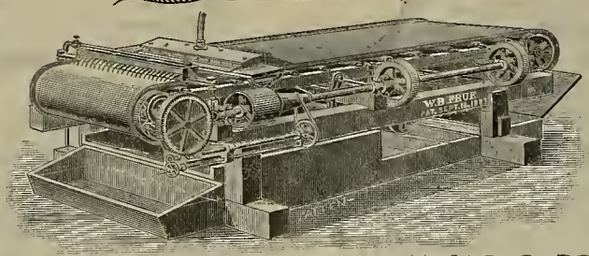
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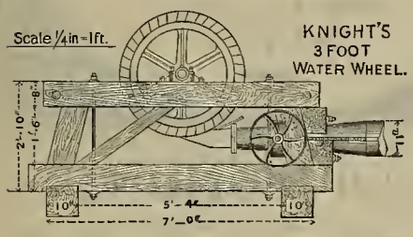
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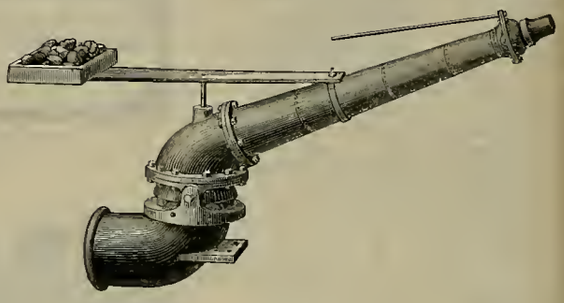
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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 10. SAN FRANCISCO, SATURDAY, SEPTEMBER 7, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Sending Pictures by Telegraph.

Readers of the MINING AND SCIENTIFIC PRESS have noted numerous references to a system of "sending pictures by telegraph," and numerous inquiries have been received as to how it was done, or how it could be done.

There are two or three methods. In our opinion the most intelligible way is that recently copyrighted by W. H. Lowd, train dispatcher for the Northern Pacific Railroad at Duluth, Minn., herewith illustrated and described in outline. It is simple, easily understood, and practicable in any locality where tolls are at all reasonable.

Supposing, for instance, a journal in San Francisco wants to reproduce, for to-morrow morning's issue, the picture of some one who has in some way got himself or herself into temporary prominence to-day in Los Angeles or Denver or Portland. A cipher chart, similar to that herewith shown in Fig. 1, is before the operator and artist in the sending office and the receiver in the San Francisco office. The photograph or drawing or sketch to be transmitted is enlarged or reduced, as may be found necessary, by means of a pantagraph on the chart, which consists of a sheet of paper on which are ruled 476 little blocks, each about a quarter of an inch square, each of which are subdivided into nine minute blocks or squares, somewhat of the general appearance of a 40-mesh screen. These blocks are numbered from one to nine. Across the top and bottom of the chart are letters designating and referring to the 476 blocks, and on the sides are similar designations, the system of reference being readily understood. Either the letters or the words can be used, though in long-distance telegraphic transmission words are more conducive to accuracy. Where lines pass between the squares fractions are used to indicate the direction. The little diagram in the upper left hand corner of Fig. 1 shows the manner of fractional division. Where corners are required every square through which the curve passes is designated. Blocks that require shading are so mentioned and the color of different blocks also designated, though for rapid work nothing but outline drawing is practicable. Every line and curve can be closely reproduced by the little squares and described by the cipher dispatch giving the two dimensions.

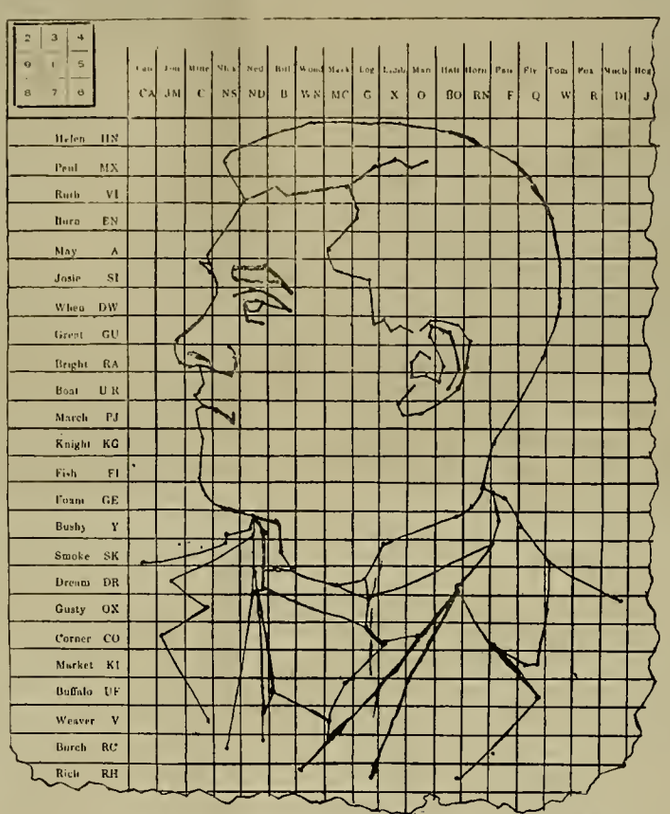


FIG. 1. — LOWD'S CIPHER CHART FOR SENDING PICTURES BY TELEGRAPH.

Let us suppose, then, that the picture of some one in a city 1000 miles from San Francisco is to be sent here by telegraph to-night for re-production in to-morrow morning's paper. The chart shown in Fig. 1 is in the telegraph office. The sending operator sends the following cipher message, which reads like a ridiculous mass of words:

From Ruth Ned 8 "To" May mine 6 Josie Nick 8 when Nick 2 great mine 3 great Jim $\frac{6}{7}$ bright Jim $\frac{5}{6}$ bright mine 8 7 boat mine $\frac{1}{4}$ $\frac{7}{8}$ March mine $\frac{3}{4}$ $\frac{1}{3}$ knight mine $\frac{3}{5}$ fish mine 7 foam mine $\frac{3}{5}$ foam Nick $\frac{7}{8}$ bushy Ned 3 $\frac{1}{3}$ bushy Nick 7 smoke Nick 3 smoke can 7.

From bushy Ned 3 7 dream Jim 1 gusty mine 5 corner Jim 9 weaver mine 6.

From bushy Ned 7 dream Ned 7 burch Nick 1.

From dream Ned 3 burch Ned 4.

From bushy Ned 3 6 dream Ned 6 $\frac{5}{7}$ Buffalo Bill 9 weaver Ned 4.

From Buffalo Bill 9 weaver Mack 9 burch Mack 2.

From dream Ned 6 corner log 3 corner limb 8 Buffalo Mack 4 weaver Mack 9.

From dream Ned 4 dream Bill 4 dream Mack $\frac{1}{7}$ gusty log $\frac{3}{4}$ corner log 3.

From foam horn 4 $\frac{5}{6}$ bushy hall 4 smoke limb 2 dream log 1 dream Mack $\frac{1}{7}$.



FIG. 2.—PERFECTED FOR PRINTING FROM FIG. 1.

From smoke fan 2 gusty log $\frac{3}{4}$ dream log 1.

From foam fan $\frac{5}{6}$ bushy fan $\frac{5}{6}$ smoke fan 2 dream hall $\frac{5}{6}$ rich wood 2.

From rich hall 5 buffalo fly $\frac{5}{6}$ corner fan 8 dream hall $\frac{5}{6}$ market man 8 rich log 5.

From foam horn 4 foam fan 1 bushy fly 9 smoke Tom 8 gusty much 2.

From smoke Tom 8 gusty Tom 9 market fly 5 $\frac{1}{6}$ corner fan 8.

From Ruth Ned 8 Paul Nick 1 $\frac{4}{5}$ Helen wood $\frac{3}{4}$ Helen limb $\frac{3}{4}$ Helen hall 1 Helen horn 7 Paul fan 5 Ruth fly 1 burn Tom 9 Josie Tom $\frac{1}{7}$ when Tom $\frac{1}{7}$ bright fly 5 knight fan 9 foam horn 4.

From March mine $\frac{3}{4}$ March Nick $\frac{3}{4}$ 6 5.

From bright mine 7 6 boat Nick $\frac{3}{4}$ bright Nick 6 5 $\frac{3}{4}$.

From bright mine $\frac{2}{3}$ $\frac{5}{6}$.

From when Nick $\frac{1}{3}$ when Ned $\frac{2}{3}$ 4 when Bill 6 when Ned 5 9 $\frac{5}{6}$ $\frac{5}{7}$ 5.

From when Ned 9 great Ned $\frac{3}{4}$ $\frac{1}{3}$.

From Josie Bill $\frac{5}{6}$ Josie Nick $\frac{5}{6}$ $\frac{4}{5}$ Josie Ned $\frac{4}{5}$ when Bill 4.

From Ruth Ned 8 Ruth Bill $\frac{1}{3}$ $\frac{1}{4}$ Ruth Mack $\frac{4}{5}$ Paul log $\frac{5}{6}$ Paul imb 1 Paul man $\frac{5}{6}$ $\frac{1}{3}$.

From Ruth Mack $\frac{1}{3}$ burn log 2 9 May Mack $\frac{5}{6}$ Josie Mack $\frac{1}{2}$ 5 Josie log $\frac{1}{3}$ great log $\frac{1}{3}$ great limb 2 1 $\frac{1}{3}$ great man 9.

From great man 1 4 great hall 2 $\frac{1}{3}$ great horn $\frac{1}{3}$ bright horn 8 boat hall 5 March man 1 March limb 5 $\frac{3}{4}$ boat man 9.

From bright man 5 $\frac{1}{3}$ $\frac{5}{6}$ boat man 2 $\frac{3}{4}$ boat hall $\frac{2}{3}$ bright hall $\frac{7}{8}$ great man $\frac{5}{6}$ $\frac{1}{3}$ great hall 1 $\frac{5}{6}$ bright hall 6 boat hall 1.

From bushy Ned 3 bushy Bill $\frac{1}{2}$ smoke Bill 1 dream Bill 4.

From corner limb $\frac{5}{6}$ corner man $\frac{1}{3}$.

From Josie mine 5 3 4.

Hair cut close on back of head and neck. Hair parted and combed forward and up.

The operator at the receiving office has a similar chart, and follows with a pencil the instructions sent over the wire as above. The receiver keeps his pencil on the paper till he gets the word "from," which indicates a new starting point. He goes on without removing his pencil from the paper till "from" is ticked out, when he begins on the square indicated, and so on. "To" is understood, and is not used. The cipher message printed above is what would be sent in transmitting by telegraph the picture herewith presented. The figures closing some of the printed paragraphs, "$\frac{2}{3}$, 6, 5," etc., when they thus follow each other, are the ones in the block last indicated by words. When he has finished he hands the chart, which then looks just as Fig. 1 does on this page, to the newspaper artist who fills in the sketch, reduces it, puts it through a rapid process, and in a few hours the paper appears with the picture as in Fig. 2, which in this case is a faithful likeness of Mr. Lowd, the inventor of the system here described. Of course, the whole thing is, necessarily, somewhat crude. Like the dog dancing on his hind legs, the wonder is not that it is not done well, but that it is done at all. By skill, accuracy and close attention on the part of the sender and receiver, it is possible to instantaneously transmit a faithful reproduction of any ordinary-sized picture.

Fig. 1 on this page shows the present state of the process. The cut is not as fine as the elaborate and costly engravings that usually appear in this paper, but is presented as illustrative of what can be done in "sending a picture by telegraph," and how it is done.

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San Francisco, September 7, 1895.

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THE quickest mail time ever made from Europe to San Francisco was last week's receipt of letters here ten days from Queenstown. It seems incredible that a letter should he carried across the Atlantic ocean and across the American continent—nearly 6000 miles—and delivered at one's residence here in ten days' time, hut such is the fact.

"THE relative cost of producing an ounce of silver and an ounce of gold," about which so much has been written hy monometallic financiers, has additional interest now attached hy reason of evidence furnished in the workings of Colorado and Utah mines where gold is produced cheaper than silver. Such facts like the discovery of silver in sand upset all former theory and fanciful argument.

ENGINEERS' FEES are sometimes as large as lawyers' fees. In the parliamentary inquiry into the feasibility of the Manchester Ship Canal project, the late Capt. Jas. B. Eads was paid $50,000 for his expert testimony. Prof. E. A. Fuertes, of Cornell, who is superintending the rebuilding of a portion of the City of Santos, Brazil, on a sanitary hasis, is to receive as his fee four per cent of the total outlay, which is estimated will be $4,000,000, making the professor's emoluments on this one "joh" $160,000.

A COLORADO SPRINGS, Colorado, stock hroker, sends us his weekly letter, which opens in a deliciously sarcastic vein. He says: "Everything pertaining to the mining stock market for the past week has heen satisfactory to those of conservative views." It is a good deal like the expert who recently visited a promising mining property in one of the northern counties of this State, where everything was being run on the proposition that one should never do anything to-day that could he put off till to-morrow. His report was that the management was "too conservative."

URANIUM is reported found in considerahle quantities at Columbine, a new Colorado camp. The published accounts of the find do not agree with the general characteristics of that rare metal which is of value and in use in the manufacture of uranium glass, in coloring porcelain, in photography, etc. Its high cost has prohibited its use in other branches of manufacture. In '90 it was quoted at seventy-five cents per gram; in '93, one dollar; in '94, two dollars. The atomic weight of uranium is 240; its specific gravity 18.7. The salts of uranium are what is used in the commercial processes ahove mentioned. Pitchhlende, in which uranium occurs, has heen found in this State, South Dakota and in Gilpin Co., Colorado, one deposit in the Wood Lode, in the latter locality, heing found particularly rich in that heautiful metal.

Now that the date for the annual convention of the California State Miners' Association is announced, there will probahly appear the usual fakirs with their "souvenir," "official programme," etc., to beg and coax merchants and manufacturers of mining machinery and supplies to take advertising space therein. Every year this ohtaining of money under false pretenses is repeated, the wonder heing that any shrewd, intelligent advertiser can for a moment suppose that any such publication can do him one cent's worth of good in any way. He and his competitors in the same line of husiness may see a copy of the few dozen printed, hut no possible customer will ever see it; or, seeing it, will pay the slightest attention to it. It is an annual swindle, and deserves no more consideration than that accorded to any other mendacious mendicant.

LABOR UNIONS and other organizations are reported "hoycotting" national hank notes, refusing to take them for goods or services. As an indication of their feeling toward the national hanking system such action is in some localities a popular form of emphatic protest. The Government is pledged to redeem the national hank notes, and this one potent fact militates against any "hoycott" or refusal to receive them for merchandise or lahor of any kind. It is not a constitutional question. The national organic law recognizes gold and silver alone as money. The issue of the national hank note, like the issue of the "greenback," was duly authorized by Congress, and the legality of such action upheld hy a Supreme Court decision. The uational bank notes are not legal tender for private ohligations, hut as they are readily redeemahle in money that is, any refusal on the part of any one to accept them simply involves some confusion, annoyance and delay.

IN the general determination of the South African gold companies to reach deeper levels come the usual prohlems; among them ventilation and safe and speedy means of exit and entrance for the men. These prohlems are being discussed in the South African and European mining journals, and will, douhtless, be satisfactorily solved. Some of the statements elicited will seem crude to Pacific coast miners, who long since successfully overcame the same difficulties confronting the South African gold miners in deep mining. Just now the published statements regarding ventilation largely amount to elahorate calculations of the increase of the temperature of the earth at depths of 1000 and 2000 feet, etc., and the prohable amount of heat generated hy oxidation of sulphurets. While such subjects are of scieutific interest, it is probahle that the managers of the mines in question will be more inclined to take into account the amount of heat and foul air generated hy and emanating from several hundred hearty men in a deep mine than ahstract prohlems of pyritic oxidation and earth temperature. Regarding the securing of swift and safe means of egress and ingress it is also likely that considerahle advance in ideas will he made from the present status of the discussion, wherein it is gravely stated that "men cannot he expected to go up and down 2000 or 3000 feet of ladders." The California miners on the Randt, whether in charge as superintendents, managers, foremen, shift hosses or any other capacity, can give practical points from experience and ohservation that will quickly dispose of such primitive ideas regarding getting in and out of a deep mine. They can tell of hoisting works on deep mines in California, Nevada and Montana, where thirty-five men on a douhle-deck cage can with safety he hoisted out at the rate of 2400 feet in a minute. Such speed has been common in mines on this coast for the last twenty years, whether for ore cars or men, and the quality of machinery used, and the skill of those in charge, have reduced the possihility of accidents to a minimum.

Taxation of Minerals in Mexico.

Consul-General Crittenden reports to the Government from Mexico regarding the recent change in that country's revenue laws regarding the taxation on gold and silver products, the full text of which was puhlished on pages 350 and 351 in the issue of the PRESS of June 1st, '95.

It has heen suggested that this measure may he construed as an export duty, and would perhaps invoke the action of the United States by retaliatory legislation next winter. Secretary of the Treasury Limantour of the Mexican repuhlic says it is not intended to act as an export duty, hut as a necessay measure for internal revenue.

Each Mexican state has the privilege of securing, and does so secure, a large part of its revenue by imposing an "extraction tax" on ores. The new federal tax amounts to 5 per cent of the value of the silver and gold, it being deemed expedient to collect the tax on the ores when they are centered at the various metallurgical establishments, or, if destined for export, at the port of exportation.

To prevent mixing up the federal extraction tax with the state extraction tax, the Mexican government decided to change the name, collecting it partly as a stamp tax and partly as a coinage tax, to be collected internally. The exact method for the collection of the tax is not yet puhlished, hut it is thought prohahle that the government will establish revenue officers in all large mining districts and at the most important smelting works in order to collect the tax internally on the ores, whether shipped from their point of original production to the local smelter works or shipped to points of export.

From what may he termed the contemporaneous exposition of the law, it cannot he considered an export tax, as its scope is not confined to the silver and gold exported in the form of silver hullion, hase bullion or ores, but is also levied on all silver and gold contained in ores, which are reduced locally, and which are taken to the mint for coinage. A coinage tax of approximately five per cent is as old as the country itself since the time of the conquest, and the object in view under the new law is to make all the silver and gold produced in the country enter under the same conditions and pay the same tax which has always heen paid hy such silver and gold which has been treated in the country and introduced into the mints for coinage, therehy materially increasing the revenue.

The law has occasioned great interest in Mexico; and while it may apparently affect Americans holding concessions and rights in their smelting and mining operations, yet it will ultimately he visited upon the heads of those engaged in the daily operation of extracting the ores from the mines. If the metallurgical estahlishments which pay the tax upon the bullion and copper matte which they export should succeed in transferring the burden of the tax to miners from whom they supply themselves with ore, then it is evident that, although the smelting works estahlished in Mexico may not suffer to any appreciable extent, the tax must become an additional hurden on mines and mining interests. In this sense it would affect, to a greater or less extent, those already engaged, or intending to engage, in mining operations in Mexico.

The law went into effect on July 1, 1895, and calls for a tax of 3 per cent as a federal stamp tax, and 2 per cent coinage tax, aggregating the 5 per cent. From the 3 per cent tax there are no exemptions made hy the law in favor of any one, or for any purpose. From the 2 per cent coinage tax there is hut one exemption, viz., smelters operating in that country (generally American enterprises) under concessions granted them hy the Mexican government will not pay the coinage tax on the silver contained in their lead hullion if the assay value of such hullion does not exceed seven-thousandths, say 204 troy ounces per ton; the coinage tax will not be paid on silver coined in copper matte shipped hy such smelters unless the assay contents exceed twenty-thousandths, say 503 troy ounces per ton. In case these limits are exceeded, hoth the stamp and coinage tax must he paid on the excess. The gold contents of hoth the hullion and matte must pay the full 5 per cent tax.

Mr. Crittenden gives credence to the helief that should our Government have any underlying idea of

a protective effect of the new law which is not apparent, and reimpose the duties provided for by a former law, then the object of the Mexican government to make it an export tax, should such an object exist, would be accomplished more fully by such action on the part of the United States, without the odium of an exportation tax attaching to the Mexican government.

A CIRCULAR signed by sixty-two mining men is received, announcing intention to organize a miners' association at Spokane, Wash., to include Washington, Idaho, Montana, Oregon and British Columbia, the first general meeting to be held on October 2 and 3, when permanent officers and committees will be chosen, the organization to be styled The Northwest Miners' Association. The expressed intent of the organization is commendable. Intelligent cooperation and mutual support will be of benefit to the mining industry throughout the region named. Some British Columbia journals have seen fit to say that the idea is solely to form a union of mine owners and that the ultimate object is to put down and keep down the price of labor. It is probable that this statement is actuated by that singular hostility to all things American constantly manifested by our northern neighbors who, whether in mining or any other pursuit, seem to deem it necessary to carp at and decry anything and everything that emanates from the United States. It is for the creators of this new organization to see that such ill-natured and premature criticism shall have no just cause for existence. The mining industries of the Northwest need just such an institutiou as that proposed for protection and development, and will find plenty to occupy the earnest attention of all its members. Prices, whether of labor, material, or anything else, are matters that settle themselves and cannot be successfully dealt with by any association or organization. Development of the mineral resources of the country, resistance to corporate encroachment, securing friendly and suitable legislation, diffusion of latest and best methods of mining, circulation of up-to-date mining knowledge, concerted efforts to advance mining interests in general, are among the legitimate aims and intents of the proposed organization, and its life and efficiency will be in direct proportion to the honesty, zeal and intelligence with which these and matters of kindred intent are treated.

THE semi-annual report of the Broken Hill Proprietary Company, L't'd, of Barrier Ranges Silver Field, New South Wales, for the half year euding May 31, '95, is received. It is an elaborate publication, containing the directors' report and detailed reports from the general manager, the mine manager, the chief metallurgist, the superintendent, etc., severally, with schedules, balance sheet and statements of account, auditors' report, with working plans, etc. As the biggest "goiug" silver mine, its report is of interest. In the two years ending May 31, '95, this property has produced 13,678,341 ounces of fine silver, 10,829 tons lead and 8425 ounces of gold. During the six months ending May 31, '95, 11,687 tons of bullion treated produced 3,773,539 ounces fine silver and 2914 ounces gold. The report every half year shows a decrease in cost of productiou. For the last half year each ton of ore treated cost £2 11d: the previous half year £2 3s 7d, which was a reduction on the cost during the half year preceding that. The net profits for the six months of which the report treats were £344,760 7s 8d.

THE increase in the world's annual gold yield attracts universal attention. In '92 it aggregated 7,041,822 fine ouuces; in '93, 7,662,077, an increase of nine per cent; in '94, there was an increase of 26½ per cent on the figures of the preceding year, the yield being reckoned at 8,781,014 ounces. It is estimated that the world's gold yield for '95 will aggregate 9,800,000 fine ounces, an increase of twelve per cent over the yield of '94, or over forty per cent over the yield of three years ago. Of this, the United States is expected to show a total product of 2,200,000 ounces, Australia and Africa the same, and other countries 3,200,000. At $20.67179 per fine ouuce, the estimated gold yield of the present year will add over $202,000,000 to the permanent wealth of the world.

Concentrates.

THE gold receipts at the Denver Mint for August aggregated $335,144.77.

BUTTE, MONTANA, is now producing copper ore at the rate of 2,000,000 tons per annum.

A MILE of tramway iron was received at Oroville last Monday for the Golden Summit mine.

THERE are 250 men employed at the Iron Mountain in Shasta Co. The force will shortly be increased.

VIRGINIA, NEV., papers say 'tis useless for idle miners to go there expecting work on the Comstock.

A 100-TON smelter is to be built at Trail Landing, B. C., and is expected to be ready for treating ore by Nov. 1.

THE owners of the Mountaineer mine, Nevada City, will sink their shaft 400 feet deeper. It is now 800 feet deep.

THE Leiter Mining Company of Sheridan, Montana, are about to build a 20 stamp mill seven miles from Sheridan, a tramway, ore houses, etc.

THE Columbia River Hydraulic Mining Co. is about to put in a $100,000 mining plant on Smith creek, near Revelstoke, B. C.

THE Nogales *Oasis* publishes a report that five million dollars have been offered for the United Verde copper mines and refused.

THE output of the East Helena, Montana, smelter for 1895 is estimated at $3,000,000. Three hundred men are given employment there.

THE Cariboo, B. C., Hydraulic Mine's ditch, at Quesnelle Forks, is seventeen miles long—one of the largest in the world. Water was turned in last week.

THE Detroit Copper Mining Company is putting in a new pipe-line between their pumping plant on the river and their reductiou works at Morenci, seven miles.

THE antimony mine near Kingston, Idaho, has closed down. But seven cents per pound could be got for the product, and under the system of extraction that didn't pay.

SILVER is reported discovered in Ohio, but not at a political convention. Alleged silver ore was found by well diggers this week at Canal Dover, at a depth of 145 feet.

IT is believed from comparison of approximate estimates that the gold production of the United States for the first eight months of '95 is considerably over $30,000,000.

THE number of stamps in present operation in the Witwatersrand, South Africa, district is 2745. In this State the number is estimated to be slightly in excess of 3000.

A CONTRACT for running the Butte Basin tunnel at Mokelumne Hill has been let to L. Record of San Andreas, patentee of the saw machine recently described in these columns.

INCLUDING freight duty and original cost, Liverpool salt is landed at Vancouver, B. C., for $10 per ton. The freight from Vancouver to Nelson over the Canadian Pacific Ry. is $13.16 per ton.

THE rehearing asked for by Alvinza Hayward, the Hobart estate and the directors of the Hale and Norcross Mining Company, in the Hale and Norcross case, has been denied by the Supreme Court.

IN the last week the Webber group of mines at Lakeview, Idaho, on Pen d'Oreille lake, has gone into the hands of a receiver, and the principal mine buildings have been destroyed by an accidental fire.

ACCORDING to the Folsom *Telegraph* the guards of the prison put in their idle time mining in the river, which is quite dry above Rohher's ravine. It is said they make their cigar money by a few minutes' work each evening.

THE Phœnix *Herald* says the Premier Extracting Company, which is working the tailings of the Vulture mine above Wickenberg, Arizona, are handling fifty tons of the tailings per day and extracting 90 per cent of the gold.

FIFTEEN THOUSAND pounds of silver were shipped by Wells-Fargo to San Francisco from the City of Mexico last Saturday morning, under the escort of two special messengers. The money is intended principally for Oriental export.

SOME specimens of contorted slate from the quartz vein of the Mahoney mine at Sutter Creek, Amador Co., from twelve to twenty inches thick and unconnected with the walls of the mine, have been received at the State Mining Bureau.

THE report of the Rohinson Gold Mining Company of South Africa, for the six months ending June 30, '95, shows an ore product of 81,376 tons, which produced 72,129 ounces gold, the gross value of which was £259,508, an average of £4 13s 3d per ton.

THE Homestake mine at Rossland, B. C., is now in the hands of a corporation—the Homestake Gold Mining Company—stocked for $500,000. The Homestake mine was one of the first located in Trail Creek. Men are now working on a tunnel and shaft.

A PARTY of five practical prospectors are exploring around the eastern and northeastern base of Mt. Shasta, on the assumption that somewhere under that lava-capped area will be found a spot where erosion will give chance to determine if gold exists beneath.

G. G. GARVIN of Oro Grande writes that the recent statement published so extensively of startling developments in the gold fields of Oro Grande district is entirely false; that there are no new finds whatever in that district, and that only one man is employed at the Carbonate mine.

SINCE the passage of the new Montana law requiring mining corporations to pay a fee of $5.50 for each thousand dollars subscribed capital, the mining companies incorporated in that State are not inclined to pay from $1000 to $1500 in official fees, and the capital stock is placed at a very moderate figure.

CONTRADICTORY REPORTS come from Arizona about the Harqua Hala mines in which a rich discovery was lately reported. The Arizona *Republican* says: "From a gentleman who just came from Harqua Hala, it is learned that the mines have closed down and that the cyanide plant only is at work on the tailings."

THE silver smelter at Great Falls, Montana, will start up in the next sixty days. A contract has been completed with the Moulton company at Barker to ship the accumulation of lead ore which has been piling up on the dump for some time, and the silicious ores of Neihart are again being shipped to the Falls.

SAN BERNARDINO COUNTY SUPERVISORS propose a system of sign-boards, guide-posts and other land-marks for the 15,000 square miles of desert in that county, so that prospectors and others will be less likely to wander and die of thirst. A hundred poor fellows have lost their lives in that region in want of just such a system as is now proposed.

THE new survey of the boundary line between California and Nevada will give this State some hundred square miles. Nevada also gets a slice of California, but California has the advantage by a few hundred square miles. The mining camp of Sylvania, which heretofore has been right on the boundary line, will be in Nevada, the same as other contiguous mining camps.

AT last Monday's meeting of the California Debris Commission permits to mine were granted to the owners of the Corkscrew mine near Spanish Ranch, Plumas county, and the Willow placer mine near Sierra City. Permits to erect impounding dams were granted to the owners of the Cascade mine in Plumas county and the Eureka hydraulic mine near Placerville.

A BULLETIN by the Geological Survey of the production of lead in the first six months of 1895 shows a total of 106,000 tons, of which 88,000 were desilverized lead and 18,000 soft lead. Seventeen thousand five hundred tons of this were refined in bond, the remainder being obtained from American base bullion. The total is an increase of 3500 tons over the first six months of 1894 and 6000 over 1893.

THE *New Northwest* says more men are employed in the mines of Butte than ever before in its history. The payrolls of all the big companies are the largest ever known, and more money is being deposited in the banks by laboring men than at any period since Butte became the greatest mining town of the world. Every smelter in the district is taxed to its full capacity and leasers are thereby required to wait for weeks for returns. Intending leasers are scouring the hills of the district for promising copper properties and everywhere there is hustle and activity. It will be the greatest year in Butte's history.

AT the meeting of the Anti-Debris Association at Yuba City last Saturday, the officers of the society alone were present. President C. E. Stone read his annual address, in which he discussed the DeGuerre Point dam and the question of continuing the association. The appointment of Commissioner Kidder and his drawing a salary was denounced and the secretary was instructed to call Governor Budd's attention to the matter. It was resolved to continue the orgauization. C. E. Stone, T. B. Hull, B. F. Walton, Robert Millar and G. W. Hutchins were elected directors. They organized by electing C. E. Stone president, B. F. Walton secretary and G. W. Carpenter treasurer.

AN advertisement is now running in an Eastern paper calling for 500 men to work grading the road in Sixteen-Mile Creek canyon, near Toston, Montana. The advertisement states that "the wages paid is $2 per day, less $5 per week for board. Supplies are furnished by the company on the ground. Payments are made for labor in time checks, which are secured by first mortgage bonds on the railroad. These checks can be sold at 75 cents on the dollar, but they are worth more, and will doubtless be paid on the completion of the road." Probably to an Eastern man this is an alluring offer. It is not hard to figure out how the man who accepts the offer will find himself in debt at the end of his period of labor.

THE following from the *Alaska News* is to the point: The papers in all mining districts are urging miners to contribute mining items for publication in their columns. Miners should heed such appeals, as they will find that a majority of the mining items appearing in their local papers are copied in the metropolitan journals. The miner should understand that although his local paper may have a somewhat limited circulation, it also has an exchange list, through which well-written articles reach thousands of readers all over the world. The press is friendly toward mining interests, and, too, does not overlook Alaska, and no charges are made for publishing facts about the progress of mining enterprises.

JAS. R. MORSE, a San Francisco mining man, has taken into partnership the King of Korea, and will work the Khusan gold mines in that country, about 180 miles from Seoul. Morse is to employ the men, buy the machinery, pay all demands out of the proceeds of the mine, pay his royal partner one-fourth the net profits and keep the rest himself, the partnership to continue twenty-five years. If half what is told of the richness of that Korean gold district is true, Mr. Morse has a good thing. In his concession is also the privilege of employing American miners and importing American-made mining machinery free of duty, and any property acquired by Americans in Korea in connection with the enterprise is not to be taxed. In case the requisite capital is forthcoming and the mines turn out well the matter is of considerable importance.

THE Canadian nickel mines at Sudbury, Ontario, raised 112,037 tons of ore last year, of which 87,916 tons were smelted. The ore only contains a small percentage of nickel, however, so that the amount of the nickel contained in this large quantity of ore was but 2570 tons, which was accompanied by 2748 tons of copper and some 3½ tons of cobalt. The cost of producing the nickel matter from the ore is heavy. It is crushed and then roasted, which gets rid of some of the sulphur. Smelting is effected in water-jacket furnaces, the charge containing eight tons of roasted ore to a ton of coke, the result being a matte containing some fifteen per cent of nickel. This matte is not usually refined in Canada, but is exported as it stands. The Vivians, however, Bessemerize the matte, raising the contents to forty per cent of nickel before exporting it to Wales. Other processes of reduction are being experimented with, among them an electrolytic process, which is, however, handicapped by the tariff on the acids required.

Personal.

ERNEST L. RANSOME, well and favorably known here in connection with the Pacific Stone Co., has organized the Ransome Subway Co., in Chicago, to manufacture a jointless pipe of concrete for sewer and water pipes, electric conduits, etc., with headquarters in the Monadnock block.

South African Gold Fields.

A region that in '94 produced almost as much gold as the United States, and promises to yield $50,000,000 in gold in '95, is of interest to Californians and Pacific coast residents. France and England have taken extraordinary interest therein and have made extraordinary investments. The sudden prominence in the mining world of the region around Johannesburg is one of the wonders of the century. The one district known as the Witwatersrand, in the Transvaal republic, is, so far as its productive area is concerned, not over fifteen miles wide and about sixty miles long, and ten years ago it was laid out in stock farms that were selling for so much or so little per acre. To-day the mines located upon this narrow strip have a London market value of $150,000,000. And, as here some years ago, men who a short time ago hardly possessed a dollar are to-day worth millions. Cecil Rhodes is said to be worth $40,000,000. His friend and associate, Alfred Beit, of the firm of Wehruer, Beit & Co., as much more; J. D. Robinson, of the Robinson mine, $35,000,000; Henry Nourse is quoted at $15,000,000; F. A. English the same; and Piet Maraes, $10,000,000.

Californians are prominent there. Hamilton Smith, Hennen Jennings, Gardiner Williams, John Hays Hammond, L. S. Seymour, T. H. Leggett, and twenty others are directing big enterprises at princely salaries.

The city of Johannesburg is a "boom" town, in many ways unlike Virginia or Pioche, Butte or Leadville, Deadwood or Denver. It is a city of 40,000 from all nations, but governed by a slow Dutch Board who keep down all the usual accompaniments of a "wide open" mining town, except stock gambling, which is an element they cannot control.

The discovery of the auriferous blanket or conglomerate beds on the Witwatersrand was just ten years ago. In 1885 $50,000 would have bought all the farms of the entire district. Single claims have since sold for three times that. The news of the discoveries soon reached Kimberley, and it was mainly the Kimberley crowd which took hold and developed the mines. The deposits were found in a shale, unlike anything else anywhere in the world. They are not in quartzite veins, but in associated beds of a sort of conglomerate which is reef-like. The main reef is about 1200 feet wide, and the principal workings have strung along for eleven miles.

It was on account of the peculiar geological character of the formation and the unexpected presence of gold in a conglomerate bed that at first led even expert engineers to declare the fields worthless. One celebrated engineer, sent out at heavy expense, pronounced the alleged find an absurdity. From the very reef on which he stood millions of dollars worth of gold have been taken out.

The deposit is in a bed that takes the shape of an enormous bowl. The same deposit will be found at a deep level some miles away from the outcrop of the reef. The English law is that a claim extends into the earth on vertical lines and not according to the "strike" of the vein, as in the American system. So, knowing that the vein could be tapped at a distance, an American engineer, Hennen Jennings, conceived the idea of sinking a long shaft at a distance from the main reef. This was the beginning of "deep level" workings, and from these many of the richest mines have been and are now being developed.

When the Rand was first opened up a town was forthwith established right on top of the reef, but when later it was found that underneath the streets and stores were valuable beds of gold, the Government opened up a townsite a little distance away, selling the lots at auction, or rather selling ninety-nine-year leases. These yielded a large sum, and have since increased enormously in value. This was the beginning of Johannesburg. When the town was first laid out all the supplies and machinery for the mines had to be brought from the seaboard, and for 300 miles of the distance were carried in ox wagons. By the end of 1892 the Cape Town railroad was built in, and now two others have been completed through. The mines extend along the reef from some miles in either direction, and their big crushers and the chimney stacks of the engine houses stand out against the horizon. The mines are equipped with immense stamp batteries and these, with the great furnace houses, the chlorination and cyanide works, with the adjacent reservoirs of tailings and of slimes, following one after another over the grassy depths and rises of the country for miles and miles, present a scene unparalleled in any part of the world.

At the Witwatersrand the output of gold has increased at a greater ratio than the crushing capacity of the various mines, which is accounted for by improved processes. In June, 1892, when the gross production was 103,252 ounces, the number of stamps at work was 2035, while in July, '95, when the output totaled 200,941 ounces, the stamps numbered 2745. In June, '92, the amount of gold recovered from tailings by means of the cyanide process was 15,722 ounces; in July, '95, it was 54,446 ounces. In June, '92, the total recovered from the battery was 82,395 ounces, being at the rate of 40.48 ounces per stamp. The amount obtained from the batteries in June, '95, was 132,016 ounces, or over 48 ounces per stamp. This increase in the productive power per stamp—the more remarkable in view of the fact that the average yield from the battery has fallen from 9.92 dwts. per ton in June, '92, to 9 dwts. last month—is explained by the improved machinery now in use. By the employment of heavier stamps, usually 1050 pounds, the production of the mills has been materially increased. In June, '92, the average duty per stamp was 3.14 tons per day; in June, '95, the average had risen to 4.12 tons per day. In January, '95, the average was as high as 4.23 tons per day; at one particular mine—the New Primrose—the daily average is regularly over 5 tons, and at other mines, like the Robinson, Crown Reef, Durban, Roodepoont, etc., the average is almost that. In June, '92, 2035 stamps crushed 158,351 tons of ore, being at the rate of 77.81 tons per stamp for the month; in June, '95, 2745 stamps crushed 290,000 tons, or 105.64 tons per stamp for the month. These figures show the enormous strides which the Rand gold-mining industry has made in mechanical and scientific progress.

Further development of the fields is in progress. This month crushing begins at the first of the great deep-level mines, the Geldenhuis Deep, which will run 200 stamps.

The number of white workmen employed at the mines last year was, according to the official returns of the Chamber of Mines, 5652. Of Kaffir laborers the number employed last year was 40,504. It is estimated that by the end of the present year 60,000 Kaffirs will be required, with a proportionate increase in the number of white workmen. The average wage paid to white workmen at the mines is $26.25 per week. The working hours average 9.6 per day, or 57 per week.

E. P. Rathbone, mining inspector, has translated the Dutch official mining report for the year ending December 31, 1894, into English, from which it is learned that toward the close of the year 141 companies actually at work sent in statements.

The nominal capital amounted to £24,702,815; the issued capital amounted to £22,940,321; the working capital, inclusive of cash payments to vendors, amounted to £7,869,811, or 34⅓ per cent of the issued capital. The total amount of dividends paid out by all mining companies from the commencement up to the end of the year 1893 amounted to £3,503,867, or a sum equal to 20 per cent of the value of the gold production. The dividends paid out during the year 1894 amounted to £1,647,063, or a sum equal to 20.5 per cent of the gross value of the gold produced during the year, or 47 per cent of the total amount paid in dividends up to the end of the year 1883.

At the end of the year the total number of diggers' and prospecting claims held amounted to 62,489, an increase of 14,288 on the beginning of the year. A statement is affixed to the report, showing for the year the total expenditure of all the mines (64 gold and 24 coal) amounted to £6,153,410. The following recapitulation of the gold output of '94 is given:

	Ounces.	*Value.*	*Per cent of total output.*
Free gold (mill)	1,457,103	£5,243,707	68.4
Tailings	694,625	2,091,730	27.3
Concentrates	84,471	318,909	4.1
Alluvial	3,666	12,806	0.2
Total	2,239,865	£7,667,152	100.0

During 1894 the total number of white workmen employed in the industry was 5653, and of Kaffir workmen there were 42,504. This is an increase of 1404 whites and 12,253 natives over the previous year. These persons extracted from the ground 3,489,015 tons of ore, and, taking them all round, their average productive value works out at £160 per head. The State Mining Engineer then passes to consider particularly the Witwatersrand gold field, including Johannesburg, Boksburg, Krugersdorp, Florida, Koornkop and Blaauwbank. These fields have produced nearly 88 per cent of all the gold produced in the State, and at the end of 1894 the total area held under mining rights amounted to 88,775 English acres. During the year the number of claims increased by 14,034 prospecting and 439 diggers'.

ENGINE BUILDERS now employ hollow steel shafting for electric railway power houses, made from an ingot which is cast in a vertical mold about twice the diameter of the finished shaft. The lining of this mold is perforated. While the metal is fluid it is subjected to a hydraulic pressure of 7000 tons, which remains on it until the ingot is cold. This process of fluid completely prevents blow-holes and cracks, and makes the metal practically homogeneous. Sufficient is cut from this ingot to forge to the length of the proposed shaft, and a hole the size of that in the finished hollow forging is bored through it. The piece is then reheated, and a mandril the size of the finished hole is run through it. It is then forged out to the necessary length under presses varying from 7,000 to 14,000 tons pressure. The steam hammer is not used in any of this work, as the blow is apt to produce only surface impact. After the forging is finished, it is placed in an annealing furnace, heated and allowed to cool slowly, thus relieving it of all forging strains.

The Mines of Amador and Calaveras.

Interview with SENATOR E. C. VOORHEIS by Special Correspondent.

Senator E. C. Voorheis, of Sutter Creek, California, recently passed through San Francisco on his way home from Alaska. While he had many incidents to relate about his trip and the beautiful and grand ice scenery of Alaska, still he held that mining in California was far ahead of any other place, and especially mining in Amador and Calaveras and along the mother lode generally.

On the Yukon river, after many difficulties, the miner has only a short season in which to work—at the greatest, three months—and then the snows begin and the ground becomes ice-bound, and the prospector lays in stores for the long winter, at, generally speaking, '49 prices. Some of the large quartz mines are so low grade that expensive plants have to be erected, much beyond the means of ordinary mining development companies. Such a mine and plant is the Treadwell mine at Douglas Island.

In South America also, although labor is cheap and correspondingly poor, transportation of material and supplies cost much more.

Mr. Voorheis had a letter from Mr. Woakes of London, general manager of the Darien Mining Co., at Cana, U. S. of Colombia, inquiring prices of acids needed in chlorination, and incidentally mentioned common salt (which product was controlled by the Government) as being quoted at ten cents per pound.

Most of the material needed by the Darien Mining Co. would have to be transported by coast steamer from Panama and afterwards by long journey on pack mules for many miles through a tropical roadway from the coast to the mines in the interior of Colombia.

Why should capital seek investment in these far-away places, where chances of success are much more doubtful than at home?

There is no mining man who, in a conservative mood, imagines that the craze in the London and Paris stock markets about South African securities is likely to continue. As yet there is no mine in South Africa where the chances of development in depth are to be compared with our own Utica and Kennedy mines and the mines of the Grass Valley district. Indeed, it is difficult to conceive any area in the world more extensive or more favorable for quartz development than this same mother lode mining region, which extends from Nevada county through Placer, El Dorado, Amador, Calaveras, Tuolumne and Mariposa counties.

Many accounts have been written of late about old abandoned mines being reopened, which cheap, modern methods of mining and saving sulphurets make profits now certain. A dozen years ago these mines could not be profitably worked. And again, it is only of late years that any great development in depth has been attained by the mother lode mines. In the larger dividend-paying mines the end of the pay shoot is not reached at even 2000 feet in depth.

Referring particularly to Amador and Calaveras, it is understood that the Plymouth mine is under bond for sale abroad. The North Gover, near Amador, is being opened by Col. Trumbo, of Salt Lake City, and others. At or near Sutter Creek, the Mechanics is under bond to Valentine & Co., and the Wildman & Mahoney is being worked by Bostou capitalists.

The Central and South Eureka companies are also preparing to begin work anew, while the Amador Queen, owned by English capital, will also soon begin work. The Kennedy, at 1950 feet, continues a big dividend-payer, and the Argonaut, immediately adjoining, yet to be heard from. The Zeile pays well, with very low grade ore.

Across the river Mokelumne, and in Calaveras county, activity is centered in the extreme south and extreme north, along the lode.

The Utica mine, in the south, will probably soon repair the damage from the recent fire and remain clearly in the lead in California mines, while the Gwin mine will probably be heard from when the crosscut from the 1000-foot level is run to strike the vein, north of the old works. The Utica-Stickles is credited with a monthly output of over $500,000.

Mr. F. F. Thomas, mining engineer, is in charge of the new Gwin Development Co.

The two properties immediately south of the Gwin, and known as Gwin Extension No. 1 and Gwin Extension No. 2, have been bonded from McSorley Bros., of San Andreas, by Mark B. Kerr and San Francisco capitalists for $30,000, and exploration and development work will be begun in a few weeks.

Between the Gwin and Utica many prospects exist, which will probably be exploited at no distant day sufficiently to show that capital is safe to invest in them.

All this is pleasant to see, and to know that capital invested in a good prospect in the deep mines of California, where conditions, locality, water, power, fuel and good surface rock exist, will handsomely reward the investors. So let us say, "Why invest abroad when chances so good exist almost at our door?"

Critical Periods in the History of the Earth.*

By JOSEPH LE CONTE, of the University of California

NUMBER II.

CRITICAL PERIODS.

The thesis which I wish to maintain, then, is that there have been what I have elsewhere called "critical periods" in the history of the earth, *i. e.*, periods of very general readjustments of the crust of the earth, and therefore of widespread change in physical geography—so great and so general as to affect profoundly and widely the climates of the earth; that these physical changes in their turn gave rise to still more marked changes in organic forms, and finally that these changes together form a rational basis for the primary divisions of time.

These great and comparatively rapid changes in organic forms are produced in the following ways: 1. The changes in physical geography open gateways and permit migrations in many directions. 2. The changes in climate, besides their direct effect on organism, compel migrations mainly north and south. 3. These migrations in their turn precipitate different faunas and floras upon one another, producing severe struggles between invaders and natives, and therefore the destruction of many forms of both, and large modification of the survivors. 4. The foreign invasion compels many natives in their turn to migrate, and so the wave of invasion, of severest struggle, and of consequent changes is propagated as far as physical conditions will allow migration. The effect of all this must be a more rapid rate of evolution of organic forms, as the result (*a*) of a new environment, and (*b*) of a severer struggle for life. The more rapid rate of evolution, and especially new opportunities give rise to higher dominant classes. These higher dominant classes again in their turn determine changes in lower forms, especially their immediate rivals, and these changes are again propagated downward through the whole organic kingdom and compel a new adjustment of the whole on a different basis.

The great theater of physical changes, of extensive migrations, and of severe struggle, and therefore of rapid evolution, especially of higher forms, and therefore also the place of first appearance of dominant classes has undoubtedly been what Huxley calls Aretogæa, *i. e.*, North America, and Eurasia north of the Himalayas and Sahara, or all the northern hemisphere north of Central America, Sahara and the Himalayas. This, the greatest body of contiguous or continuous land, has in later geological times been sometimes united, sometimes divided. It has been subject to the greatest changes, the widest migrations, the severest conflicts, and therefore the most rapid evolution of dominant forms. But these dominant forms have from time to time, as opportunity offered, invaded more northern lands, and always as conquerors.

Signs of Critical Periods.—The greatest revolutions are marked in the rocks (1) by widespread unconformities, and therefore by a loss of records which is greater in proportion as the unconformity is more general. But since unconformity always means eroded land surface, widespread unconformity must mean greatly enlarged eoutinents or a continental period between two comparatively oceanic periods. (2) They are marked by great, very general and apparently sudden changes in organic forms, affeeting not only species, hut also genera, families and orders. (3) By the introduction of new and higher dominant classes. (4) By the birth of great mountain ranges. Of these characteristic signs the most general and important is the change in organic forms. This is, therefore, the most important means of determining the primary divisions of time, hut the other signs are usually concurrent and are therefore confirmatory. The secondary divisions are based on less general changes, and are therefore themselves more loeal in their application.

It must not he imagined, however, that these great revolutions of the earth's crust are catastrophic, in the sense of heing instantaneous. On the contrary, although they were periods of exceptional commotion, they continued probably hundreds of thousands of years. Nor were they simultaneous everywhere in any mathematical sense. On the contrary, the changes were douhtless propagated from place to place until readjustment was complete; so, also, and still more certainly, the changes in organic forms were propagated from place to place hy migrations and conflicts as already explained. Therefore the line of delimination hetween the primary divisions will not he drawn at exactly the same horizon in all places.

I wish now to show that there have been several such critical periods, or periods of very great changes affecting the whole earth, and that they form a rational hasis for primary divisions of the geological record, applicahle to all parts of the earth. I begin with the last; not hecause it is the greatest, for it is indeed in many respects the least, hut because it is the nearest to us and therefore the clearest, and on this account may he expected to throw light upon the real nature of such periods. I shall call such periods critical periods of revolutions.

1. THE GLACIAL REVOLUTION.

The Drift or Quartenary or Glacial Period, or Ice Age, I am couvinced constitutes one of these critical periods and the last. I have called it the Glacial Revolution.

The cause of the glacial climate we shall not discuss. Whatever it be, whether geographical or astronomical, or both, it is certain that it was attended with great and widespread oscillations of the earth's crust hy elevation and depressions in all high latitude regions. The greatness of these oscillations we are only beginning to understand. The North American continent, for example, was certainly raised at least 3000 feet and probably much more. The continent was enlarged until the shore line advanced to and even beyond the submerged continental margin. In Europe the elevation was equally great. It is prohable, also, that the southern hemisphere was similarly affected nearly if not absolutely simultaneously. From the distribution of organic forms in the southern hemisphere there seems much reason to believe that the Antaretic continent was elevated and enlarged until it connected with and connected together the point of South America, South Africa, Australia and New Zealand. The effect of these great changes in physical geography would be to produce corresponding extreme changes in climate and wide migrations of organic forms, partly permitted hy changes in physical geography and partly enforced hy changes of climate. These migrations extended not only throughout Arctogæa, but also southward into all the southern contiuents except Australia. Madagascar and the coast islands of California seem also to have escaped. These great changes, as already explained, determined a more rapid evolution of organic forms, especially among the higher animals.

This, then, I helieve ought to be regarded as a critical period, and therefore a dividing line hetween two primary divisions of the earth's history, viz.: the Cenozoic and the Present. The Present, therefore, contrary to the view of most geologists, I regard, and insist on it, as a primary division of time, and the glacial period as the transition of critical or revolutionary period separating it from another division, the Cenozoic.

I so regard it hecause it hears all the marks of a primary division of time. 1. There is widespread uncouformity of present sediments on all previous strata. This is seen in old river heds, in the deposits of great glacial lakes, and in all the sea margin deposits as far as the submerged continental margin. In addition to this, if we admit the great enlargement of the Antarctic continent already mentioned, the unconformity extends over the whole Antarctic ocean hottom. If to all this we add the unconformity of the drift itself on its eroded hedrock, surely the wideuess of this unconformity is scareely inferior to that of any other critieal period. Very much of this is now concealed heneath the ocean hy subsequent subsidence of land. 2. There are here, also, very great and rapid changes in organic forms, especially among mammals. The change in the mammalian species since the Tertiary, *i. e.*, during the Glacial Revolution, is complete. In lower forms the change as yet is less complete than in previous critical periods. I said as yet heeause it is still going on rapidly. 3. There is here the introduction of a new and higher dominant type, man. I must stop a moment to enlarge on this.

(*To be continued.*)

*Bulletin No. 11, of the Department of Geology.

THOSE eugaged in mining have frequent need to know the composition of a mineral, or to ascertain its compositiou from a given formula. The process is simple, but unless one is constantly iu practice, it is easily forgotten. For instance, take the mineral galena, which has a simple composition of lead and sulphur comhined in proportions governed by nature's unchangeable laws. The formula of galena is PbS, or lead and sulphur comhined according to their atomic weights. The atomic weight of lead is 206.4; that of sulphur is 32. The following is the process to ascertain the percentage of each element: The atomic weight of lead is multiplied hy 100 and the sum divided by the 238.4, the total atomic weight of the two elements in the mineral. This will give the percentage of lead. The percentage of sulphur is obtained in the same way.

THE United States Coast Survey was estahlished by Congress in 1807 upou the recommendation of President Thomas Jefferson. Active operations by the Survey did not, however, commence till 1817, but were almost immediately interrupted hy want of funds. It was not until 1832 that Congress made a liberal appropriation for the fund, and then all existing charts had become so inaccurate as to make the navigation of our coast extra perilous.

SAMPLES of ore from South Africa, from the Langlaate reef, Johanneshurg are conglomerates, one heing a hrown surface oxidized ore running $18 and nearly all free milling, while the other is grayish iu color and of a sulphide nature running $14 a ton. The concentrates after amalgamation run $76 in gold.

Clouds and Sunshine in California.

The average percentage of mean cloudiness and sunshine hy seasons, with the average uumber of clear days, are as follows for the Weather Bureau stations named, and are deduced from the monthly charts issued by the United States Weather Bureau, Washington, D. C.:

STATIONS.	Mean cloudiness, percentage of	Mean sunshine, percentage of	Average number clear days	Mean cloudiness, percentage of	Mean sunshine, percentage of	Average number clear days	Mean cloudiness, percentage of	Mean sunshine, percentage of	Average number clear days	Mean cloudiness, percentage of	Mean sunshine, percentage of	Average number clear days
Eureka ...	48	52	12	50	50	12	28	72	21	36	64	33
San Francisco	47	53	35	33	57	38	13	57	29	35	65	12
Los Angeles..	34	66	49	44	56	36	31	69	39	25	75	54
San Diego	39	61	37	49	51	36	46	54	24	37	63	38
Red Bluff. ..	45	55	38	38	62	42	12	88	81	22	78	70
Sacramento ..	37	63	39	31	69	52	07	93	85	18	82	68
Keeler.....	26	74	60	24	76	61	12	88	70	16	84	74
Fresno	45	55	31	31	69	51	07	93	85	15	85	65

It will be noticed hy the ahove table that during the winter season Los Angeles and the interior of California south of the Tehachapi range of mountains has a greater percentage of sunshine than does the portion of California lying north of the above named mountain range, excepting Keeler, which has the greatest percentage of sunshine at all times except the summer season, when Sacramento and Fresno have the same amount, while Red Bluff is the same as Keeler. The latter (Keeler) has a greater annual percentage (80) of sunshine than any other portion of the State, as well as more clear days.

The interior of California, in the Riverside region and surrounding sections, has a very high percentage of sunshine, equally as much so as is reported from Sacramento.

There is no record of cloudiness at Riverside that has been regularly and continuously tabulated for a numher of years past, and for this reason the exact percentage of mean cloudiness and sunshine cannot be given, but enough is known of that region to he safe in claiming a higher sunshine percentage than any other portion of California south of the Tehachapi mountains, excepting the desert region between Salton and Yuma and Barstow and the Needles, where it may average somewhat higher and prohably equals or exceeds the record of Keeler, which place shows an average of 80 per cent of sunshine annually and an average annual number of 274 clear days.

Riverside, during the winter season, has a greater percentage of sunshine than does the Sacramento and San Joaquin valleys, and equals those valleys in spring, summer and autumu.

Books Received.

"*The Mineral Industry: Its Statistics, Technology and Trade,*" *Vol. III, 1894, edited by R. P. Rothwell.*

The third volume of this annual compendium is fully up to the just expectations of those who found in the first and second volumes of this work so much of practical value to appreciate and approve. On receipt of the second volume this journal spoke in cordial endorsement and sincere praise, and can now only repeat what was then said. The third volume of nearly 800 pages is accurate, thorough, truthful and comprehensive, and besides elaborate statistics and up-to-date information on matters mining and metallurgical has many valuable monographs on different matters directly connected with the mining industry from specialists in the several lines treated. It is published by the Scientific Publishing Co., 253 Broadway, New York; price $5.00, postpaid.

"*Gravitation and Cosmological Law, a Mathematical Demonstration of the Secret of Gravitation and Attendant Phenomena,*" *by M. F. Singleton; from the Franklin Printing and Publishing Co., Atlanta, Ga.*

The author says that the object of the work is to show that all the laws of gravitation which have been determined empirically, or by observation, can be deduced independently of any inherent attraction which one body may be supposed to have for another; that is, that regardless of the existence of matter or the attributes of matter gravitation can be demonstrated as a pure mathematical proposition. There is in his book considerable that is new, and a little that is good. For a mathematician he "assumes" and "imagines" too much, and as a theorizer his figures are made to assume the usual pliancy. It is difficult to understand what even the author himself considers when he imagines "all space filled with a saturated solution of matter," and any one who would seriously "imagine" such a singular state of affairs would probably find satisfaction in the serious contemplation of the tangible effect of a chimera revolving in a vacuum.

"*Hot Water Heating, Steam and Gas Fitting,*" *by Jas. J. Lawler.*

This is a 284-page octavo, written by a practical man who knows what he is talking about and tells a great deal in a plain, simple way about hot water heating, steam heating and gas fitting. A great deal in this book has been told before, but never in such a way as to be more plainly intelligible and of greater direct practical benefit to the men who put up and attend to the fittings and appliances of which this book treats. Considerable of it is in relation to conditions that do not exist in California or on this coast, hut there are very few pages in this admirable work that would not be found of practical value to any and every builder, maker or user of gas, steam or hot water fittings. The book is published by the Excelsior Publishing House, 26 City Hall Place, New York City; price, postpaid, $2.

BY the census of 1890 the center of population was in latitude 30 deg. 11 min. 56 sec. and longitude 85 deg. 32 min. 48 sec., at a point a little west of south of Greeusburg, the county seat of Decatur county, Indiana. Between 1880 and 1890 this center moved westward about forty-eight miles and northward about nine miles.

Mining Summary.

CALIFORNIA.

Amador.

GENERAL NOTES.—*Republican*: Work preparatory to hoisting the water from the shaft is being pushed ahead on the Good Hope. Just below the mine on the margin of the creek, an excavation has been blasted into the side hill to admit of a ten-foot breast wheel. To this wheel the water on the south fork of Jackson creek will be conveyed by means of a flume extending over 300 feet up the creek. The flume is ten feet above the ordinary bed of the creek, and to get water into it a dam has been built that height, which will raise the creek bed that height by the deposit of tailings from the Zeila mine, backing the water some 500 or 600 feet.

At Amador Queen No. 1 the shaft is free of water to the bottom 100 feet below the tunnel level, the tunnel being 40 feet from the surface.

At the Anita a contract is let to run 300 feet of drift, 200 feet north and 100 feet south.

The Reward mine has shut down temporarily. The mill is running on some custom rock, and when this is crushed it will close until the ditch can be repaired to get in water. This will take about five weeks to accomplish. The payment of the balance on purchase price becomes due in October. There is little doubt that the purchase will be completed at that time.

At the Argonaut they are building a foundation for an air compressor for the purpose of inaugurating machine drilling in the near future.

Calaveras.

THE FORD MINE.—At the Ford mine the intention is to sink 200 feet, and then a crosscut will be started.

El Dorado.

THE CANYON CREEK PLACER MINE.—*Gazette*: A company of Eastern capitalists have been prospecting this mine, about three miles north of Georgetown, with a view to buying it, and have recently had surveys made for the purpose of locating the lines and extending it to the river. The tailings from the Georgia Slide and Oregon Canon mines lodge in Canon creek and have been accumulating there for years, and working them over ought to pay well. If this claim is properly opened it cannot be other than a paying property. The price asked is said to be $25,000.

Kern.

AMALIE DISTRICT. — (Special Correspondence): There is considerable prosperity in mining circles nowadays. Mr. A. Sauser the superintendent of the "Brogan" is pushing work as rapidly as possible and taking out some fine ore.

The Amalie Mining Co. expect to have their new hoist in operation in a few days, having completed their raise to surface making a shaft 250 feet deep. As soon as the hoist is ready they expect to begin sinking from the 250-foot level.

Work is being pushed on the "Picnic," a contract having been let for sinking. Since the work was begun there has been some very fine ore taken out.

The Dull brothers have put on a night shift and are sinking on the "Mayflower" with all possible speed. They have good prospects and it is thought that depth is all that will be required to increase its richness.

Mr. J. B. Gault has discovered and located a claim showing some very nice ore.

Mr. Brooks, a mining expert of many years standing, is giving this country a thorough inspection. This is the kind of people the Amalie district likes to see, for her mines and formations will bear the closest inspection.

There is being considerable assessment work done and a number of good leads have thereby been opened up.

Mr. F. D. Lanterman, Deputy U. S. M. Surveyor, discovered a lead and located a claim which joins the Occidental on the southwest and thus it is that new leads are being discovered within a very short distance of our richest mines. This shows that our country has never been thoroughly prospected, this lead being within a five hundred feet of the boarding house and mill of the Amalie Co.

Considerable excitement was caused among the miners here when it was ascertained that Frank Dean, who had been so long in the employ of the Amalie Co., was under arrest for stealing ore; it also put mine owners on the lookout and a watchman was placed on both the Amalie and Occidental mine.

Messrs. Young, Foster and Parker struck ruby silver in a claim recently located. This is the second mine in the State from which this character of ore has been taken—the Amalie, from which this district takes its name, being the first. G. E. F.

Mariposa.

MERCED G. M. CO.—The Merced Gold Mining Co. is building a dam across Black Creek, above the old 49 mill to get sufficient power to run a stamp mill at the Potosi mine.

Placer.

ANOTHER "LOST MINE" FOUND.—The lost "Emigrant mine," about twenty miles east of Cisco in Placer county, has at last been found, after a search of five years. The ore body is very extensive and is reported to go $200 per ton.

San Bernardino.

SOLD HIS INTERESTS.—A. G. Tingman of Holland & Tingman has sold his interest in mines in the Pinon district, including a half interest in the Pioneer mill for $25,000. That mine is now running on ore from the Lost Horse mine.

MINES BONDED.—Isaac Reed, E. E. Rowell and Judge A. Brunson have bonded the Sweden mining claims, in the Virginia Dale district, three miles south of the Virginia Dale mine, to San Francisco miners, for $10,000, to run 30 days.

At the Rose mine they are down 400 feet with a bigger body of ore in sight than ever before. The ore which is shipped runs $260 to $300 per ton. Dr. Shugart, the superintendent, expressed the opinion that they were now below the breaks and the ore hereafter would run more even. The low grade ore milled at the mine runs about $30.

Lewis and Townsend's mine, a half-mile from the Rose, though a small property, shows up well. Metcalf, in Rattlesnake canyon, cleaned up $400 in bullion on a 30-days run with one horse and an arrastra.

In Holcomb Valley, Upper Holcomb, Gold Mountain and Morongo King, everything is flourishing. The mountains are full of prospectors, there being more men at work than ever before known and all of them feel encouraged.

HOLCOMB VALLEY MINING CO.—At the Holcomb Valley Mining Co's mine the steam shovel and 30 men are at work sluicing rich gravel which pays for the first time in the history of the company.

San Diego.

THE GOLDEN CROSS.—E. M. Browder, the representative of an English company, is again reported making overtures for the purchase of the Golden Cross mine and its entire plant. This is the same mine for which it was reported $2,500,000 was offered by another syndicate of English capitalists and refused about a month ago. It is thought a sale of the property could be effected were it not for a fear of legal complications. The new 100-stamp mill of this mine will be working this week which, with the present mill, will make 140 stamps in all.

Shasta.

THE MOUNTAIN MINING COMPANY. — *Free Press*: It is a good sign when on going along the street one can see tacked upon a post the sign, "One hundred men wanted." We have so long been accustomed to see one hundred men or more wanting employment, that we are rejoiced that the tables have been turned. This is the result of the operations of the Mountain Mining company. It is estimated that the company would expend a million dollars before they turned a wheel to produce bullion. Increased activity is noticed all along the line, and the McCormick-Saeltzer company keep the road lined with teams hauling freight from their large establishment. Men are being put at work as fast as accommodations can be provided. The new town started on the Skillen ranch has been named Keswick. Here the survey stakes have been set for the smelter and work is well along on the two-story and a half boarding house. Grading for the railroad is progressing rapidly, there being several camps located and graders at several points.

It is stated that at the mine the company are running a tunnel of large propositions, large enough in fact to permit a railroad train to enter. This really is the purpose contemplated, in order to load the ore on the cars and carry it to the smelter the road will be a narrow gauge; from Keswick to Bull's bar three rails will be laid to permit the hauling of broad gauge cars with a narrow gauge engine.

The expert and general manager, Mr. Hill, has been traveling over the county in search of silicious ores to be used in smelting. From one source we learn that he has met with good success; others state that he has not found as large a quantity as he had hoped and of sufficient value. Joseph Bell informs us that the ore required must have a value of at least $10 per ton, while others state that ore going above $4 will be purchased. Mr. Bell expects to make a contract with the company to furnish fifty tons of ore per day.

Elias Ellery has been getting out some very rich ore at his mine above French Gulch, and will start his Huntington mill Monday and expects his usual good cleanup.

Ellery, Filman & Co., at Trinity Center, are erecting a mill. Wm. Stevens is doing the work. Their tunnel is in 125 feet showing a three foot ledge, 18 inches of which assays very rich.

James Salee has secured a bond on the Bully Hill mine at Copper city, and will put sixteen men at work there immediately. He will run two tunnels, one 300 feet long and the other 700 feet long. Rails, cars, etc., have been shipped by wagon. He will erect a boarding house and make preparations for a long siege. The tunnel work will be let by contract. When he gets ready to take out ore he will haul it to the smelter which the Mountain Mining company propose to erect near the mouth of Spring creek. The formation is quartzite on the foot wall and stratified slate on the hanging wall.

NEVADA.

ESMERALDA COUNTY.

SILVER STAR GOLD BELT.—Silver Star is situated about eight miles west of Soda Springs, a station on the Carson & Colorado railroad, some forty miles south of Hawthorne, in Esmeralda county. The mines lie on the north side of Messiah mountain, and are in Douglass mining district. The country rock of the district, says Dan De Quille in the Salt Lake *Tribune*, is trap or diorite on the north side of the mountain, and it is in this formation that the gold veins are found; on the south side limestone is the prevailing formation, with a strong syenite belt running parallel with and between the limestone and the diorite. The gold-bearing veins run east and west and the syenite appears to form the foot wall of the whole mineral belt. The mountain itself is a huge one, and the only one in all that region that was heavily timbered.

The mountain rises to a height of 8800 feet above sea level, and the mines are situated on its slope at an altitude of from 6500 to 7100 feet. All the veins are well defined and vary in width from two to twenty feet. The vein material is a friable calcite. In this gold is found in the free state and containing a very small per cent of silver.

The mines yield near the surface from $120 to $150 a ton and at the east end of the system there are seven veins lying from 300 to 400 feet apart. These veins seem to converge at a point about a mile west, where on a ridge the vein is thirty feet wide on the surface, the surface material assaying from $9 to $12 in gold and about 80 cents in silver. At depth this large bulge is liable to contain a bonanza of great size.

As the strike of the several veins of the system is east and west some are of the opinion that they are feeders of a big mother vein that has a north and south course and still lies undiscovered in the heart of Messiah mountain. Most of the experts, however, are opposed to this notion, and assert that the mines are situated on genuine and permanent lodes. All the leads, both great and small, on which development work has been done have all the earmarks of well-defined, independent veins, and their walls are smooth and regular.

Although the majority of mineral veins have a north and south course, there are many instances of very rich east and west veins and systems of veins in all parts of the world. North and south seems to be the natural course of main mineral-bearing lodes, but they are in many places found to have been so far swung out of that direction as to lie squarely east and west. In mountain ranges there not infrequently occur kinks or twists in which a considerable section may be so far turned aside that any veins contained in it will be seen to lie at a right angle to the course of the main range. Portions of mountain ranges may have been turned aside from the general course by some great convulsion of the earth or crowded out in the form of a "kink" by the shrinkage of the earth's crust.

In the Great Basin region the mountain ranges run north and south, and the dykes and belts of rock of which they are composed follow the course of the ranges, as do the main veins of quartz. This is the rule, but as stated above, there are places where there are twists in the ranges. The general course of a rope thrown loosely upon the ground may be north and south, but in places sections of it will lie east and west. There are similar kinks in mountain ranges whose blocks of many square miles are "slewed" round out of the general course.

There appears to be a twist of this kind at Silver Star. Thus we find on the south side of Messiah mountain a limestone formation, with a strong parallel belt of syenite, while on the north side of the mountain lies a diorite formation. As all of these big belts of rock lie east and west, it is but natural that the quartz veins should also run east and west. In the vicinity there have been great upheavals and convulsions. At the time when the gold-bearing veins were formed they and the big syenite dyke, with the other belts of the formation, may have had a north and south course out of which they were afterward twisted by some great disturbance that turned the big mountain half way round on its base. It is easy to understand how the shrinking of the crust of the earth might cause such kinks in a mountain range. In that way might be produced at great depth some peculiar "faults" not easily discovered.

On the several veins thus far discovered in the camp, many claims have been located, and already about a dozen of these are paying well, while others are fast being opened and developed.

OREGON.

THE BONANZA MINE.—Baker City *Democrat*: The Bonanza mine yesterday sent in a gold retort worth over $5,000, the result of thirty days run with five stamps.

BRITISH COLUMBIA.

CARIBOO DISTRICT.

THE CARIBOO DITCH AND MINE.—From tables published in this paper showing the duty of water per inch, the *Mining Journal* calculates regarding the new Cariboo ditch — really a canal instead of a "ditch" — that with an average of 2500 feet of water playing on the gravel of the Cariboo mine, about 10,000 yards per 24 hours will be moved. The results of the wash up will naturally give confidence in others interested to develop and prove properties. In a comparatively small section of country where primitive methods were used, Cariboo shows already an output of $40,000,000 in gold.

ALASKA.

AN IMPARTIAL OPINION.—Dr. George F. Becker, geologist in charge in this division of the United States Geological Survey, has returned from Alaska, where he has been making a survey of the gold fields along the shore line, accompanied by Dr. W. H. Dahl. This is the first work that has ever been done by the United States Geological Survey in Alaska. In an interview with a *Call* reporter he said:

The first mines examined were the Sumdum and those near Juneau, the Douglas Island, Sheep Creek Basin and Silver Basin, and farther north those at Berners Bay. These all form a large belt up and down through Juneau. Then there were some undeveloped mines near Sitka. A peculiarity found worthy of note was the presence in the gangue both in the Juneau belt and about Sitka of magnetic iron pyrites, which is a comparatively rare mineral in gold mines.

Another peculiarity I found was a great abundance of chloride as a gangue mineral. It is not a mineral that is usually found in gold mines, although it is occasionally found in the gold mines in North Carolina and Europe. It has some interest as bearing on the genesis of gold ores.

Farther west there is some good property at Kodiak island, but only partially developed. Still farther west, at Unga island, is an important mine, second only to the Treadwell and Mexican, called the Apollo Consolidated. The ore is notable in two respects. It contains a large amount of free gold in an unusually fine state of division, so that at first sight rich quartz looks as if it had a yellow stain running through it like oxide of iron. Kidneys of this quartz with fine free gold give the value to the mine.

The other notable feature is that it contains a considerable amount of native copper, which is a very rare accompaniment of gold. Only one case of the kind has been reported in America, and that was in Virginia some fifty years ago. The Apollo Consolidated is turning out several hundred thousand a year.

I don't think there is much doubt that Alaska is going to be an active mining region, but I do not think that it will rival the California mining belt. The veins are not so large and well developed as they are here.

There has been quite an excitement this summer about the placers at the head of Cooks Inlet. The amount of success thus far achieved hardly warrants the amount of interest exhibited. The profitable washings thus far discovered are confined to a couple of miles on Bear Creek, which empties into Turnagain Arm. I think it proper to make this statement to prevent too much of a rush of people there who are not supplied with means to live on until they can find something or return. I did not visit Yukon. I learned, however, that there were a great many poor men stranded there unprepared with means, and a large proportion do not find gold. Any man who proposes to go into the Yukon country should carry along means to support him for a year at least.

IDAHO.

IN THE CŒUR D'ALENES.—Manager Bradley says he is employing 350 men. "Everything is working smoothly and to our satisfaction. Both the mine and the mill are running night and day, and we are shipping sixty tons of concentrates daily."

The Last Chance mine and mill are running at Wardner with a full force. It is employing seventy men and shipping twenty tons of concentrates daily. The Morning mine, at Mullan, is also to be started up on the same basis. The Hunter, at the same place, is also paying same wages and giving work to fifty men.

A BIG CONSOLIDATION.—The Tiger and Poorman mines on Canyon creek in the Cœur d'Alenes, consolidated last week, and will be worked under one management. The new company is called the Consolidated Tiger and Poorman Mining Company. Capital stock, $1,000,000, divided into 1,000,000 shares, 500,000 shares going to the stockholders of the Poorman and 500,000 to S. S. Glidden, the owner of the Tiger. The capitalization of the old Poorman company was $5,000,000, divided into 500,000 shares. Every stockholder in the old company will receive share for share of the new stock in exchange for the old. The Tiger was never capitalized. Spokane, Wash., is named as the principal place of business. During the nine years the two mines have been operated they have produced $10,000,000. Both properties have extensive improvements, including concentrators, hoists, air compressors, electric plants, boarding houses, buildings, etc., costing in the neighborhood of $35,000. Both have valuable water rights which will now be consolidated and merged into one system. It is expected that this will reduce the fuel bill of both mines to practically nothing for the greater part of the year, and that this alone will effect a saving of $30,000 per annum. One mine will now pump out the water for both, one hoisting plant will also serve both mines, and there will be but one management, and it is calculated that in all a saving will be effected of not less than $6000 per month.

MONTANA.

GENERAL NOTES.—The old placer diggings near Virginia City, that had been simply drifted in the early days, are now being thoroughly worked by hydraulic methods and are yielding big money.

The Royal mill is to be started up again. About fifty men are employed on the property at present, which force will be increased.

The Eureka Placer Mining Company advertises for bids for the construction of a flume and ditch to supply water to their diggings. The estimated cost of the work is $7,500.

The Volcano Mining Company, in the Boulder district, is employing quite a force of men, doing considerable development work. This is a gold property and is said to be a fine prospect.

The Southern Cross mill is running steadily day and night on ore from the Keystone property. They are said to be doing well. Four heavy ore teams are hauling the ore from the mine to the mill.

The big Parrot canal is almost completed and the contractors are now at work near Point of Rocks, where the new smelter is to be built. The construction of the branch line of the Northern Pacific to the smelter site is being pushed rapidly.

The Easton mill, near Virginia City, has again commenced operations. New automatic dryers to treat silver concentrating ores have been put in and it is expected they will prove a success. The ores from the Easton mine are required to be put through a double process, first for the treatment of gold then for the silver.

SOME DIVIDEND PAYERS. — The following dividends have been paid by Montana mines from Jan. 1st. to Aug. 1st. '95.

Am. D. & M. Co.	$ 24,340
Bald Butte	12,000
Butte & Boston	300,000
Elkhorn	50,000
Hecla	105,000
Iron Mountain	80,000
Montana Limited	82,000
Moulton	30,000
Hope	10,000
Total	$693,340

ARIZONA.

HIGH GRADE SULPHURETS.—In Chaparral Gulch, Yavapai county, Ariz., a large body of ore was struck last week in the Blaine mine about 200 feet below the surface. It is reported as a high grade sulphuret ore. It has been drifted for twenty-five feet and promises exceedingly well. The vein is from 2½ to 3 feet of solid ore, about one-half of which is shipping rock.

The Mechanics' Institute Exposition.

The Mechanics' Institute of San Francisco and the MINING AND SCIENTIFIC PRESS are about the same age. In one of the earlier numbers of this paper is an account of the "first annual fair" of the Mechanics' Institute, and year after year are found in the files the annual notices of the chief industrial gathering of the chief city of the coast.

The 28th exposition is different in some respects from any of its predecessors. There are fewer exhibitors in some departments and more in others; there is a different system by which awards of merit will be made; there is a hint of "the new era" that is announced and the advertising element is in evidence throughout. The music, pictures, statuary, aquarium and "fine arts" are not supplementary, but take precedence, and the mechanical display is more suggestive of what it could be than complete.

A representative of this journal has spent some time in looking at the display on the first floor, and while many prominent manufacturing and industrial firms are "conspicuous by their absence," finds a good deal to note and commend. He has made such mention as in his judgment the several exhibits deserved. That others probably equally deserving are not mentioned herein is because their exhibits were either absent or overlooked.

Suspension Wire Rope Way.

The first mechanical exhibit observed upon entering the Pavilion, and one that will excite the special interest of mining men, is a model of the Hallidie Wire Rope Way. It is operated by a small motor, and is complete in every detail, showing clearly its practicability and adaptability to all the varying conditions to which it may be subjected. Here also will be seen the street-car cable and grip devices which have so long and successfully been used upon the street-car systems of this and other cities. A full-sized working model of the Wire Rope Way may be seen in another part of the building. The Rope Ways are in use in hundreds of different localities, conveying ore to mills from almost inaccessible points with speed and economy, while the history and success of the cable-car systems are too well known to need mention. These are the inventions of Mr. A. S. Hallidie, who, as the pioneer in this branch of mechanical service, has achieved world-wide fame.

The Washburn & Moen M'f'g Co.

Occupying the same space with the Hallidie exhibit is that of the above named company. This comprises a full line of barbed wire fencing, wire netting, wire cable, copper wire—plain and insulated, for electrical purposes—and a specially prepared "Salamander" wire, absolutely fireproof, and only manufactured by this company, whose San Francisco house is at 8 and 10 Pine street. Mr. Frank Brown is the agent, and since the recent purchase by the company of the California Wire Works, finds a great accession of coast business. The firm is thoroughly equipped and has the deserved reputation of absolute reliability.

Joshua Hendy Machine Works.

This large and comprehensive display of machinery appeals strongly to the mining interests from the fact that it covers nearly every requirement of mining operation. So extensive is it that a description in detail involves some difficulty, but the following items will convey some idea of the broad field that it covers: Engines and boilers, hydraulic elevators, hydraulic giants (nozzles), deflectors, stamp mills, ore crushers, ore feeders, the Hendy-Norhom concentrators, water gates, iron pipe, ore cars, ore buckets, mining pumps, the "Davis" patent safety-brake horse-power hoisting whims, water buckets, etc., in addition to which is a full line of saw-mill and wood-working machinery. The Joshua Hendy Machine Works has been established so many years, and enjoys such high repute for reliability in all its special branches that comment would be superfluous.

The Risdon Iron Works.

Those who are visiting the Mechanics' Fair with a view to posting themselves on late improvements in mining machinery will not fail to carefully examine the Johnston Concentrator and the Improved Bryan Roller Mill. The exhibit is in the northwest corner of Machinery Hall and shows both machines in working trim. They are manufactured by the Risdon Iron Works, one of the oldest and best known manufacturers of ore feeders, rock breakers, mining, milling, pumping and hoisting plants on the coast. The immense works are at the corner of Beale and Howard streets, where is now being made an unusually large steam hoist for the Merced Gold Mining Co.

F. A. Huntington.

Across the aisle from the last mentioned display will be seen the Huntington Centrifugal Roller Quartz Mill. There is scarcely a mining district between Alaska on the north and Chile on the south but what has one or more of these mills in use; they are also at work in China, Japan and New South Wales. Some of the claims made for these mills are: "The cost of same capacity is not more than one-half that of stamps; freight to mine one-fourth that of stamps; cost of erection at mine one-tenth that of stamps; it runs with one-third the power per ton of ore crushed; the wear is less than that of stamps; the wearing parts are easily duplicated; it has a much better discharge and leaves the pulp in better condition for concentrating; it is a better amalgamator, saving fully nine-tenths of gold in the mill (the balance can be saved on plates in the usual manner); its simplicity of construction obviates the need of mechanical skill." In the same space is the Huntington Improved Rock Breaker and the Huntington Patent Ore Feeder. The last named is specially designed to feed the Huntington roller mill. It is simply constructed and can be adjusted to feed fast or slow while in motion, has but few wearing parts and is positive in action. Practical men who are not already familiar with these machines will regard this exhibit with interest.

The Woodbury Ore Concentrator.

Which occupies the same space as the Huntington machinery, has won a list of merits that attest its value. Though on the market but little more than six years, it has, through the untiring enterprise of its inventor and manufacturer, Mr. Geo. E. Woodbury, become widely known and is in very extensive use. Its claim for close and rapid work has been amply demonstrated. The Woodbury concentrator took a first prize at the San Francisco Mechanics' Fair of 1890-91-92, and the same at the California State Fair of 1892; also at World's Columbian Exposition, 1893, as well as at the San Francisco Midwinter Fair of 1894.

The Krogh Manufacturing Co.

This company has a fine display, consisting of centrifugal pumps, combined horse-power and triple-acting suction and force pumps, head-gates, flange, screw and hub end-gate valves, mining horse-power hoist, etc. The exhibit shows a No. 15 centrifugal pump in action, throwing a solid stream of water fifteen inches in diameter with great force. The firm has recently purchased the plant of the San Francisco Tool Co. at 9 and 11 Stevenson street, which, added to its extensive works at No. 51 Beale street, gives it unequal capacity for turning out work in its line. This firm also manufactures steam pumps, mining pumps, deep-well pumps, windmills, tanks, link-belt elevators and conveyors, wine presses, grape crushers, etc.

The McGlew Ore Concentrator.

This is another successful candidate for favor in the concentrating field. It has been at work about three years and has achieved marked success in various localities. Its claims for superiority are its low cost, simplicity of construction and operation, durability, close saving of mineral on difficult ores, great capacity and the very small power required to run it. It is adapted for either rubber or canvas belts, the speed and incline of which can be changed with the utmost ease while in motion. The machine is shown in operation and makes a most attractive exhibit.

C. H. Evans & Co.,

One of the old time machinery builders of the city, makes a good show of power pumps—a class of work for which this firm has for many years enjoyed a high reputation. Special attention will perhaps center in their New Twin Cylinder Pump, which consists of two cylinders placed alongside of each other in a horizontal position (thus avoiding all possibility of becoming air-bound), with a curved passage from one cylinder to the other at one end and at the opposite ends the inlet passage to one cylinder and the outlet from the other. Each cylinder is single-acting, and both pistons are worked from one cross-head by one connecting rod and crank, in the same direction at the same time, but the valves act in opposite directions, so that the water enters at the end of one cylinder, is passed from it to the second cylinder, and then forced on up the discharge pipe, thus keeping the water continuously moving in one direction only, through easy curves, making a very efficient and nice working pump, and one that is very simple, not liable to derangement and easy to get at all the working parts, there being only two valves in the pump, both of which can be got at by removing the one head. The crank shaft is of forged wrought iron. All bearing surfaces are extra large to avoid wear. The belt wheel is made large and with a heavy rim to act also as a fly-wheel to ensure a smooth and steady motion, thus enabling the pump to be run direct without gear wheels, doing away with their friction, noise and wear, and getting better results from the same power. The frame is strong and substantial with the metal disposed in the direct line of strain, where it will do the most good.

They also manufacture pumps for special work to order, also double-acting power pumps either geared or direct belted as required, and with single cylinders or duplex. The manufactory is at 110 and 112 Beale St.

The Rae Perfection Amalgamator.

To the left of the north entrance to the machinery hall is a novelty in the way of amalgamators that is attracting much attention from practical mining men. The proposition to rent the machine to operators of quartz mills at low rates, incurring no risk on their part, is an innovation, and one that will be likely to give the amalgamator rapid introduction. It is very simple and portable, and may well be called a poor man's friend. Full particulars may be had by writing to B. I. Turman, Mechanics' Fair, San Francisco.

Mery's Gas Engine.

Among the great army of gas engines that have been invented on the Pacific coast this one is claimed to be the nearest approach to the steam engine in action. It is a single-cylinder double-acting gas engine, using gas, gasoline, coal oil or crude petroleum with equal success. The cylinder has a sparking chamber and exhaust at each end, thereby permitting the explosive impulse to act both ways on the piston with more regularity and frequency than in other types of gas engines. A water jacket surrounds the cylinder and sparking boxes, and the piston rod runs through water when in motion, keeping it cool. It is fitted with a pendulum governor, and ignition of the gas is produced in the ordinary way by means of a battery or small dynamo.

All of these engines are tested before leaving the works. M. L. Mery & Son, the proprietors of the Chico Iron Works, are the builders, from whom all information can be obtained by correspondence.

The Gold King Amalgamator.

Among gold-saving appliances being exhibited at the Mechanics' Fair, it is safe to say that none have attracted more attention from men actually engaged in the mining industry than has this machine. A simple looking iron cylinder, hung at a slight incline from the horizontal and revolving slowly in its bearings, is the center of an almost constant group of visitors, discussing its merits from the practical standpoint of long years' experience with all sorts of devices for the same purpose. The pulp or sand carrying gold is passed through this cylinder, whereby every particle is brought repeatedly into contact with the interior amalgamating surface, which is so constructed that scouring is entirely avoided, and the claim of its manufacturers that no guilty gold escapes has been pretty well substantiated. The machine has been subjected to a great many tests during the past year with all sorts of ore and beach sand from all sorts of places, and in all instances it has come through triumphant, saving a high percentage on the assay values. The exhibit is presided over by the genial inventor, A. C. Rumble, who is also general manager of the Midas Gold Saving Machinery Co. at 114 First street, San Francisco, where the Gold King amalgamator is manufactured.

Combination Drier and Gold Separator.

This exhibit was without an attendant when visited by our representative, but the circular makes strong claims for it as being a machine that will separate gold from wet or dry earth, sand, or gravel, without the use of water or quicksilver. Its builders, Messrs. Salshury & Mooro, offer to furnish abundant evidence in proof of their claim, having had one of their machines working successfully for the past three months on a mine in El Dorado county, in this State. The firm's office is at No. 21 New Montgomery street, San Francisco.

Steiger & Kerr.

The enterprising proprietors of the Occidental Foundry have entered an almost almost untrodden field of industry on this coast, as their display of stoves and ranges near the main entrance to the Pavilion fully discloses. The display would do credit to any of the old Eastern manufacturers of these goods. Their works are at the corner of Main and Harrison streets.

The Pacific Manufacturing Co.,

In the annex to the Pavilion, make a prominent display of pump and well machinery of all kinds, the leading feature of which is its new windmill, the "Monarch," showing the parted boxes, which is considered one of the best devices that has been placed on any geared steel windmill in recent years. The old style of pipe boxes are so inaccessible that even when bahhitted at the factories where they are made the process of bahhitting is very difficult, and when the mill is set up on the farm and becomes worn, to bahhitt it with the appliances at hand is an impossibility, and the casting must be taken down with blocks and tackle, and requires the work of two or three men; then it must be carried to some foundry or machine shop for expert men to do the work. With parted boxes, as used only on the Monarch steel mill, any farmer or employe about the farm can quickly renew the babbitt; there is no necessity for taking down any part of the mill, no need for ropes and tackle or extra help; only remove the top caps and run the metal, one man or boy can do it. The Pacific M'f'g Co. is one of California's old and well-established concerns. Its place of business is at No. 575 Mission St., this city.

Baker & Hamilton.

Occupying the largest space in the Mechanics' Fair pavilion this year is the exhibit of the Benicia Agricultural Works. It is filled with such a great variety of modern farming and dairy implements that it is only possible to mention here a few of its leading features. The display of plows includes "Eureka" gang and sulky, "Eureka" improved tule sulky, "Eureka" road-grading gang, "Eureka Montezuma" side-hill, "Eureka Jr." gang and the Benicia clipper. In addition there are Benicia-built wagons, buggies, seeders, potato diggers, harley crushers, wine presses, and in creamery goods there are vats, churns, butter workers, cheese presses, etc., besides two standard Eastern makes of cream separators, and in fact every requirement of a modern creamery. Most of these goods are manufactured at Baker & Hamilton's Benicia Agricultural Works, furnishing employment, directly and indirectly, to several hundred men the year round. This firm has, in addition to its immense establishment at the corner of Pine and Davis streets, this city, branch houses at Sacramento, Los Angeles and New York. Its business has for many years extended over the western half of North America and the Latin-American countries to the south.

The Multi-Motor

Is a new departure in windmills, being practically two wheels in one. The two wheels are constructed on the bicycle principle, the weight being thrown largely to the outer rim or hands, thereby giving great leverage and increased momentum. They are so arranged with relation to each other that when the force of the wind is expanded on the blades of one wheel it strikes the blades of the next wheel at right angles and thus in a manner gets a double effect from the same wind pressure. It might appropriately be called a compound wheel. The bearings and gear are simple and accessible. The mill is intended for heavy work, and it is claimed that it will give two and a half times more power for the same weight of machinery than any other mill. Mr. C. A. Norcross is the manufacturer, at 509 and 513 Mission St.

Paraffine Paint Co.

This is an exhibit that will repay careful attention from the miner, the electrician, the fruit grower and the builder. It consists of insulating tape, armature varnish, electrical compound, acid and alkali proof paint for chlorination works, preserving wood and iron from acid, alkali, rust, decay and the ever-busy teredo, fruit-drying paper for raisins and prunes and the celebrated P. & B. building paper. For the latter the manufacturers have the following to say: "It is the only building paper manufactured on the Pacific coast. It is made of rope manilla stock, and, being thoroughly saturated and coated with P. & B. Compound, is absolutely water, acid, alkali, gas and vermin proof. Unlike tar and oil papers, it is odorless and will not dry out or rot. It is the only building paper that improves with age. A house sheathed with P. & B. Building Paper will be warm in winter, cool in summer and healthy all the year round. Used between floors or in walls, it excludes earth and sewer gases, dampness and vermin. When placed under metal roofs, it prevents the corrosion and sweating of the metal by gases generated in the building, and also serves to deaden sound caused by the lifting of the metal. It is unequalled for lining cold-storage warehouses, refrigerator cars, ice-houses and all buildings requiring a normal temperature."

The Paraffine Paint Co. can be addressed at its headquarters, 116 Battery St., S. F., or its branch house, 221 South Broadway, Los Angeles.

Pacific Coast Borax Co.

The exhibit which may be said to lead all others in uniqueness and beauty of design is made by the above-named enterprising company. Conceive of a large canopied pavilion supported by several stanch symmetrical columns surrounded on three sides by counters and backed on the south by a large oil painting representing the immense twenty-mule freight outfit toiling laboriously over Sierra Nevada mountain trails, and with every visible part, except the painting, completely enshrouded in clear borax crystals, and one gets some faint idea of the striking effect of this display. The industrial importance of this product is assuming immense proportions, largely through the efforts of this company, whose resources for mining and preparing it for market are almost unlimited. Its introduction for hundreds of domestic purposes is also being rapidly and successfully pushed all over the United States.

The Winans Automatic Damper Regulator.

At the power room operating the moving machinery of the Fair can be seen the above-named invention, which will doubtless be of interest to those having to do with boiler pressure. This device has no levers, no complications; only one valve and one connection, and that to any point on boiler where water pressure can be had. A plate between the flanges is acted upon by a spring on the lower side and by water pressure from the boiler above the plate. The pressure of the spring can be adjusted by moving the hand-wheel to balance the boiler pressure acting on the plate. A slight increase of boiler pressure forces the plate downward, opens the valve and admits water under the plunger, causing it to rise. The plunger rod is attached to the damper by rod or chain, and by the motion of the plunger varies the position of the damper, thus altering the draft at the proper instant. As the pressure decreases the spring closes the valve, thereby shutting off the supply of water, and the plunger, with the counterweight, lowers in position. The counterweight is arranged for alteration to balance any damper, the rods and chain to which are adjusted to suit each case. The instrument is nickel-plated and mounted on a substantial hard-wood backing finished in oil and ready for attachment to any convenient support in the engine or boiler room. It was invented and patented by J. C. Winans, who deals in anti-incrustation powder and other engineers' specialties at 220 Front street.

The International Correspondence Schools.

TO THE EDITOR:—On the 58th page of your valuable paper, issue of July 27th, is an interesting article on the "Value of a Technical Education," in which the following paragraph occurs:

"In our factories and mills and workshops, today, are young men with ambition, with skill and with a desire to advance. They read, perhaps, poorly, spell even more poorly, but in questions of shop practice they're entirely "at home." Talk with them; they have ideas; they cannot put them on paper, at least so as to make them understood, but they'll explain that if this and that could be done, in this or that way, such or such a result would follow. Ordinary early advantages have been, perhaps, perforce, denied them. Ordinary advantages will not now avail them. How can they now, at a minimum of cost, and without loss of wage-earning time, make up, in special branches, the loss or lack of early education?"

Our Schools are meeting the wants of over 800 just such young men, located in all parts of the world, and they are designed exclusively to meet the wants of those who cannot afford to leave home or lose time from work to get an education.

Our courses, which are 27 in number, include instruction in Mechanics, Mechanical Drawing, Steam Engineering (Stationary, Locomotive and Marine), Electricity, Architecture, Architectural Drawing, Civil Engineering (Hydraulic, Railroad, Bridge and Municipal), Sanitary Plumbing and Gas Fitting, Heating and Ventilation, Coal and Metal Mining, Mine Mechanics, Prospecting, etc. All of these courses commence with Arithmetic, so that to enroll it is only necessary to know how to read and write. Students are furnished with Instruction Papers, which are all the books they need, and with Question Papers, to bring out what they have learned. The answers are sent us for examination and correction. When they need aid students write to us, on blanks which we furnish. Such requests are answered promptly and fully. The Instruction Papers are written by our own Instructors, who know from experience just what workingmen need to learn in order to qualify for advancement, and are freely illustrated.

THE INTERNATIONAL CORRESPONDENCE SCHOOLS,
Scranton, Pa., Aug. 29, '95.

Scientific Progress.

The Production of Cyanides.

By H. N. Warren.

Since the establishmeut of the cyanide process for the separation of gold from its ores, the race for production of the compound, in quantity and at cheap rates, has been almost as keen as were the previous attempts to reduce the alluvial deposits, and thus place upon the market the aluminum of to-day. Potassium nitrate, KNO^3, has long hecn experimented with in the hopes of replacing the oxygen equivalent hy carhon, and hy so doing produce KCN; but the large percentage of oxygen which is in every case set free at once determines the destruction of any cyanides thus formed, although traces of cyanides are always observed to he present after the partial reduction of commercial nitrates by means of carbon, owing to the secondary action of the ammonia thus formed, due to the moisture present.

Rochelle salt, mixed with a quarter of its weight of potassium nitrite, KNO^2, and ignited, has given five per cent as the highest yield of cyanide obtainable, while most hydrated carbonaceous subhstances yield a still lower per cent. Anhydrous sodium acetate, in admixture with a uitrate, has yielded as much as thirty per cent of alkaline cyanide, while in a more recent experiment a mixture of four parts of wheaten flour to one part of nitrate, and the whole thoroughly mixed with three of magnesia and compressed into blocks, yielded, after iguition, from a varying percentage up to fifteen per cent of cyanide. The production of sulphocyanides, and the reduction of the same by means of lime and carhon, have on several occasious given valuable results in accordauce with the following equation:

$$KCNS+CaO+C=KCN+CaS+CO;$$

hut at other times, in consequence probably of the difficulty in regulating the temperature, has resulted in the formation of worthless substitutes.

On returuing to the old method for the production of cyanides, hy the incineration of nitrogen compounds, a valuable additiou will be found in the use of lime or harium oxide. Probably both the barium and calcium cyanides are more readily formed than alkaline cyanides; and in lixiviation, in contact with the alkaline carhonates preseut, they at once form alkaline cyanides and earthy carbonates or ferrocyanides, as arranged for.

Again, potassium and sodium cyanide together are much easier to produce than either separate, fusing at a much lower temperature, and containing more cyanogen, in consequence of the differeuce in the equivalent of sodium when compared with potassium. A mixture of equal weights of the two alkalies reacts well in every respect and yields good results.

Copper as a Conductor.

At ordinary temperatures copper is six times better a conductor of electricity than iron, hut the conductivity of each is increased by cold. Copper is ten times better as a conductor of electricity at 100 degrees than it is at the freezing point of water, and the conductivity of iron increases at a still greater rate until iron hecomes as good as copper. It has been proposed to enclose electric conductors in pipes to be kept very cold by some of the well-known processes for extracting heat, such as are in common use for ice production, as the amouut of copper needed would be less as the temperature was less. It may be some time before this plan is carried out, but that it is possible to thus reduce the cost of electrical couductivity hy ruuning an engine to produce cold is certain, and it will be done when the cost of copper hecomes commercially comparable with the cost of running an engine for such a purpose. Experiment seems to indicate that all the metals are thus affected by cold, and that at absolute zero their electrical conductivity hecomes infinite, or, as it is more generally stated, the electrical resistance of metals becomes zero. The other properties of subhstances are also profoundly changed so as to he radically different from what they are under ordinary conditions. Cohesion, tensile strength, malleahility, etc., become less and less, so it seems altogether prohable that the qualities and states of matter so familiar to us as solids, liquids and gases depend absolutely upon temperature, and that at ahsolute zero there would he neither solid nor liquid nor gas, and that electrical and magnetic qualities would he at a maximum. This opens up a great field for speculation as to the nature of matter itself, when most of what we call its properties may he emptied out of it by simply reducing its vibratory motion.

A refracting telescope is to be huilt for the end-of-the-century World's Fair in Paris, having an aperture of forty-eight inches. The Yerkes telescope, soon to be set up at Lake Geneva, Wis., for the University of Chicago, will have an aperture of forty inches, and that of the Lick telescope at Mt. Hamilton, this State (the largest refractor now in service in the world) is thirty-six. But it is proposed to have the tube of the French glass immovahle iu a horizontal position, and to throw into it images of the heavenly bodies by means of a siderostat or heliostat, a huge mirror, outside of the observatory and adjustahle, so as to take a ray of light from a moving body and continually reflect it in precisely the same direction. The maiu story of this great project has been confirmed by Ambrose Swazey, of the firm of Warner & Swazey, who make telescope mountings, but there are reasons for douhting whether the undertaking will yield any hetter results than our California telescope, if as good.

Those who have investigated the subject with scientific exactness state that only ahout six or eight per cent of the total heat value of coal is utilized in au engine by heating transformed into power. Iu tracing up this loss it is stated that there are required some 1202 degrees of heat or heat units—not degrees of temperature—to change one pound of water into steam, while during the absorption of this amount of heat the temperature of the water remains at 212 degrees. This immense amount of steam is rendered latent and does not sensibly affect the thermometer. Scientific authorities explain the cause of this loss in the steam engine as due to the fact that the 990 degrees absorbed by water in being trausferred into steam—212 degrees are apparent upon a thermometer, and which, added to 990, make up the 1202 degrees above mentioned—go into the engine unindicated by the thermometer, leave in the same manner and go to waste.

Distinct tides iu the atmosphere, corresponding to those of the sea, and produced twice daily hy inner attraction, have heeu traced hy M. Bouquet de la Grye in the barometric records of stations removed from powerful local disturhances. The recorded observations of Brest, St. Helena, Cape Horn, Batavia and Singapore, give positive evidence of a regular ebh and flow according to the moon's position. The effect is slight hut measurahle, the greatest atmospheric tide at Brest being shown hy movement of a quarter of an inch in a water harometer, which is equivalent to about one-fiftieth of an inch in the mercury harometer. The tide seems to bear about the same ratio to the weight of the atmosphere that the sea tide bears to the depth of the ocean.

A French geographical society proposes to divide the face of the clock into 10 hours of 10 minutes and 100 seconds each. This is to make time uuiform with the decimal system or count by tens. The count by twelves which uow shows on the face of the clock survives from the earliest time—probably from long before the invention of letters.

Mechanical Progress.

The Heilman Locomotive.

A rival of the Baltimore and Ohio electric locomotive is the Heilman locomotive, in use on the Northwest railroad, a trunk line leading out of Paris, France. It is said to be a success, and its admirers predict that it will supplant all competitors. While the Baltimore and Ohio locomotive is supplied with electricity from an overhead wire, the Heilman locomotive carries a triple-expansion steam engine, which generates the electricity required. Steam power produced in the ordinary way drives a dynamo borne on the tender. The motors are placed on the trucks. This arrangement is said to give a saving of 20 per cent in fuel over the simple steam locomotive. At first sight such a result seems incredible. It might be conceded that a locomotive geuerating its own electricity by the use of steam would be more economical than the Baltimore and Ohio electric locomotive, since it dispenses with costly overhead copper couductors, and is exempt from the waste of current incident to the use of long wires, but to suggest that it is more economical in fuel than the ordinary steam locomotive sounds like a joke. The explanation is that Heilman gets more power out of a given weight of coal hy using a triple-expansion engine. Ordinary locomotives are extremely wasteful of steam. By using the same steam thrice instead of once enough power is saved, it is said, to make up for what is lost in couverting ordinary power into electricity. If this be practicable, the Heilman locomotive has for most purposes decided advantages over other electric locomotives, since it can he used on ordinary tracks without special preparation. Trolley wires and poles are dispensed with—a great saving. It is suggested, however, hy the Heilman invention that, if it he a practical thing, a further development of the steam locomotive is possible, which would give it a new lease of life. For use in the long tunnels the Baltimore and Ohio locomotive remains the hest, since it produces no smoke, as the Heilmau does.

Trouble from Oil in Boilers.

The fact that the use of oil as an anti-incrustator in steam boilers should be occasionally attended by bagged furnace crowns, if nothing worse, continues to he a source of wonderment to a good many people who ought to know something of the possibilities of the oil treatment. It has heen pretty well demonstrated that a very small globule of oil, ou becoming attached to the inner side of a boiler sheet, will sometimes collect a mass of dirt particles contained in the water, the whole mixture ultimately haking on and forming an excellent non-conductor. This heing the case, the overheating and hulging of the sheet at that particular place are quite in the regular order of things. The only specially noteworthy thing about the matter is that a very thin film of oil and a very small admixture of dirt are sufficient to do a great deal of harm, and that the scale formed by them may he so inconspicuous as to readily escape detection; hence the seeming mystery which sometimes is supposed to attend the coming down of a crown sheet.—Cassier's Magazine for Septemher.

One Hundred Miles an Hour.

There is now being built at the Baldwin Locomotive Works in Philadelphia an ordinary locomotive with driving wheels of five feet diameter, which the inventor says will, as soon as completed, draw a train of cars from Philadelphia to New York in one hour. The Baldwins have nothing to say. They are simply building it for W. T. Holman of Miuneapolis, an inventor, who has desigued the machine. The locomotive is not to he set on the rails as engines ordinarily are. It is to be placed on what are known as the Holman friction-geared trucks, which will raise it thirty inches. The inventor says:

"It will be just like any engine, except that each of its driving wheels will rest on aud betweeu two smaller wheels, which in turn will rest on and between three other wheels that finally rest on the raiis. The instant the drivers of the locomotive begin to turn they necessarily through friction give an opposite rotary motion to the small wheels ou which they rest. The natural and inevitable result is that one revolution of the locomotive's driving wheels hy this multiplicity of wheels in pyramid form carries the engine just twice as far forward in a single revolution of the wheels as if they were on the track themselves."

Caisson Foundations.

A system of caisson-sinking for foundations of bridges, buildings, etc., invented hy Engineer W. d'H. Washington, of Charleston, W. Va., and receutly tested in New York, is highly spokeu of. Where the site of a proposed foundatiou is of sand or loose earth it presents great difficulties to huilders. Below the water line the earth at the sides caves iu wheu an excavation is made. The ordinary device is to sink a caissou, or its equivalent, as the excavation proceeds, to hold back the sand. Sometimes the sand at the sides, with the water it contains, is frozen in places, and rigidity is thus sccured. But there is difficulty iu sinkiug the caisson with sufficient speed, and the freezing process is not always practicable. Mr. Washington's invention consists iu the utilization of the water jet on a large scale to open the way for the descending edge of a steel caisson of the size of the foundatiou to hc constructed. The use of a siugle water jet to open the way in sand is well known. Mr. Washington places a multidude of jets about the bottom of his caisson, and the water emerging under great pressure opens a way, while weights piled on top of the caisson force it downward. In the test of July 18 one caisson was sunk to bedrock, a depth of 38 feet, in three hours. An evident advantage lies in the circumstance that by this method adjacent buildings are not endangered. The earth remains in place until the caisson is sunk. When the earth or sand in the caisson is removed there is no displacement of that outside.

A British firm of iron producers reports to the London *Times* the result of a five years' experiment with the eight-hour system. At first the cost of each ton of output was increased, hut uow it has fallen as low as it was in 1889. In other words, the men get as much work done in eight hours as they used to get done in twelve. That this is not merely the result of a coincidental improvement in machiuery or the methods of manufacture is vouched for hy the managers of the works, who have considered the point. It is reported by the Boston *Transcript* that a similar test is being made hy a New England manufacturer, who employs 700 operatives. He has not yet made a wholesale change, hut his idea is to ascertain what constitutes a fair day's product, and then to help his employers to fewer hours of labor by requiring from them only that product turned out as it may be in fewer hours than at present. If nine hours of fresher and more buoyant labor will turu out the same product as ten hours of more jaded labor, he can afford to pay, and is disposed to pay, the same wages for the former as for the latter.

By suspending from au egg-shaped balloon a hicycle gearing, with pedals to revolve a screw propeller, and adding wings at each side to steer with, an inventor has devised a flying apparatus which is reported used in daily flights to and fro over New York City. the halloon gives buoyancy merely, the screw gives motiou and the wings guide the flyer to the right or left, up or down. If all that is asserted about the contrivance is true, the problem of flight in still air or mild winds is nearly solved.

Electrical Progress.

A New Thermo-Electric Apparatus.

The thermo-electric apparatus of H. B. Cox of Hartford consists essentially of a series of metallic rings, each formed by joining a number of wedge-shaped pieces of two different alloys. The advantage of this appliance is said to be the merging of the component parts of the electrical element into each other in such a way as to have practically no junction point to oxidize. The pile of rings, separated by sheets of asbestos, forms a hollow cylinder, which is lined with cement and cemented into a metallic casing. Provision is made for the circulation of a cooling current of water between this casing and the outer shell of the generator, which, in one form, resembles an ordinary coal-burning heater. A coal fire or gas flame is placed in the interior of the cylinder, and by this simple means of transforming the heat into electricity, the inventor claims to get five times the energy from coal that can be realized by steam, and with this remarkable result—so long sought in vain by Edison, Tesla and others—to be able to produce five ordinary incandescent lights from a coal consumption costing a cent an hour.

Regarding the use of electricity in connection with the Bessemer process, it is shown that the necessary degree of heat has to be maintained for a considerable time, for if the metal begins to chill, the success of the whole operation is impaired. The prevention of the chilling has always been a problem with steel men. Recent developments in the power of the electrical furnace have also shown that it is possible to obtain enormously high temperature by the use of heavy currents, and this discovery has been utilized at Homestead. A heat was allowed to become somewhat "cold," and the current was turned on. About twenty tons of molten steel that was lying dead in the ladle immediately began to boil, and in a few moments reached a white heat. The blaze ascended several feet above the ladle and was of blinding intensity. The unaccustomed degree of heat and the dazzling glare made the operation of pouring the steel most trying, and many of the workmen had their eyes burned badly. The test was almost too much of a success. In reality, it was a terrible demonstration of the frightful temperature which it is now possible to obtain by human agency. Probably not more than a temporary injury was sustained by the workmen, but in future they will be provided with blue glasses, so as to withstand the intense light; and in future, provision will be made to have the charge of current, which at the test was excessive, under perfect control.

A company in Camden, N. J., has a force of men engaged in building an electrical carriage—a carriage to be built just as carriages now are, but to be operated by a storage battery, hidden in the bottom of the vehicle, instead of by horses. Not only do those building this carriage expect it to supersede the carriages now in use, but they declare that it will in time take the place of bicycles; and, in their enthusiasm, they add that they would by no means be surprised if the trolley cars should feel the effect of the new invention once it gets on the market and people are able to reach its price. Two of the carriages are now being built at the works of two different sorts, as far as the mechanical construction goes, but both are on the same principle. The difference is the method of operation, and these differences represent the views of an electrician in one case and of a machinist in the other. They are to be completed by the 1st of November, and will at once enter upon a race near Chicago to test the speed. They are being built of the best material, and will be in every sense first-class carriages of "trap" pattern, and are expected to cost about $1500 complete for the two. This cost, however, can be regulated if the carriages do all that is promised for them, and they can be made in the future at almost any price. In any event, the first cost will be the only real one, because they are to be equipped with a storage battery which will run the vehicle 500 miles before requiring to be recharged, and this at a cost of but 13 cents for each 50 miles. A speed of 17 miles an hour is promised for the new invention.

A location for the test of electricity as a motive power on the canals of New York State, which will be made on the 25th inst., has been fixed within the limits of Tonawauda, N. Y. The cable or traction system will be used, and both preliminary and official tests will be made. The experiments will be with eight or ten canal boats lashed together, which it is expected to move at a rate of about six miles an hour. F. W. Hawley, vice-president of the Cataract General Electric Company, says: "The result of the coming test will largely influence the electors of New York next fall when they come to vote on the question of appropriating $9,000,000 for the enlargement of the canals. Mule power cannot compete with the steam engine. On the success of the cableway or some similar device hangs the future of the world's greatest waterway."

Electricity is rapidly annihilating time and distance. A Philadelphia concern has recently received a contract for the construction of an electric railroad in Cape Town, South Africa. Already continuous lines of electric roads connect the towns and cities in this country and are being extended in all directions, and the time may come when one can take an electric car at Cape Horn and ride to the North Pole, such is the progress that is now being made in the science and art of the electrical transmission. This, too, without discomfort from heat or cold while passing through the several climates en route, for the electric current could be utilized to produce warmth in the frigid zone or furnish a cooling and refreshing breeze while racing against time beneath the scorching heat of the torrid zone.

There seems no present likelihood of any cessation of litigation between the General Electric and Westinghouse Companies. The Boston *News Bureau*, of August 14th, quotes authority "prominently identified with General Electric Company" as intimating that the position of the Westinghouse Company will have to be materially altered before there can be any hope of an alliance of interests. The same authority is quoted as stating that he "had been given assurance that the General Electric Company could, if it so desired, make almost the same arrangement with the Baldwin Locomotive Works as Mr. Westingbouse has made, in all essential features."

The following method of steeling copper plates is from *L'Electricien:* Dissolve in 500 parts of water 50 parts of sal ammoniac and 100 parts of ammoniacal sulphate of iron. Add a few drops of sulphuric acid to acidify the solution. Connect the copper object to the negative pole of a battery, and place at the positive pole a plate of iron of about the same dimensions. The solution must be maintained at a temperature of 60° to 80° C. The deposit of iron is exceedingly hard, and is formed very rapidly. Two Bunsen or bichromate cells are usually sufficient.

The first application of the three-phase long distance for electric railway work will be made by the General Electric Company, Lowell, Mass.; the low-voltage alternating current will be raised to 5000 volts, and be carried to two sub-stations, nine and fourteen miles distant, where it will be received in transformers and rotary converters and sent to the line at 500 volts.

Practical Information.

Not Luck, But Pluck.

No man ever made progress on the wings of luck. Wings, anyway, are for nightingales and angels. Legs are for men to walk mountain paths and climb to the summit. Place the letter "P" in front of the fool's word "luck." That will change any man's seat from a wilderness stump to a throne. The world never searches for a man; it always knows where to find him. The right man to wield a sceptre is not sowing wild oats out of a lazy hand, or trying to make progress on the back of the wild goose "luck." He has learned the better word and faces the world with genuine pluck. A pound of that material is worth a ton of luck. The man who thinks success is inherited fortune and a lazy life, differs from the animal only in having two legs instead of four.

Hard work is the only genius. Rags and sin are twin sisters, and borne of the old hag, Idleness. Elbow grease is the only substance for the axle of a chariot. Place the bucket of toil under the pipe; luck is a leaking pail. Pluck is the word. The individual who believes in luck makes a farce out of the world and reveals his empty head, in which the moths and mice of superstition and folly play hide-and-go-seek. They saw Edison discovered the phonograph by luck; it was an accident. But there were long years of hardest toil which preceded his hearing that sound, and long months of hardest toil which followed it before it was perfected. That streak of luck, so called, could only run through the life of an Edisou. If David is to be king he must first be the good shepherd lad. If he is to win the victory over the giant he must first know how to handle his sling. Every gun to shoot and hit the mark, must first be loaded and aimed and fired. Ram home the powder and shot, take aim, do it. Without a prepared brain, and a prepared body and a prepared character the man is sure to fail. Life is a battle; it is not parade. It is sailing through the Mediterranean islands and streams not a row on the peaceful lake. It needs everything ready; the compass and the chart, and the pilot and the captain and all ready. The water compartments closed and the ice off the lifeboat ropes.

An unprepared business man is speedily discovered; an unprepared politician is speedily found out and falls out of sight. An unprepared preacher does not hold his place or his audience. When the preparation is made and the arrow is on the bow do not fail to aim it right. There is too much random shooting, and the target never trembles. Aim to fill your place and fill it well, so well that you cannot be spared, and your death makes a void.

A loaded gun, and well aimed but not fired, is another blunder. You must pull the trigger. Dare to do. Ability unexerted is as useless as a bushel of acorns fast withering into nothingness; plant them and you will have the forest. Great things may be in a man's brain and his heart, as oaks are in acorns. Plant them, bring them out. Nobility of character and all real success are made by the doing process. Load, aim, shoot and you will hit something."

The Work of the Mississippi.

The Mississippi has, in the course of ages, transported from the mountains and high land within its drainage area sufficient material to make 400,000 square miles of new land by filling up an estuary which extended from its original outfall to the Gulf of Mexico for a length of 500 miles, and in width from 30 to 40 miles. This river is still pouring solid matter into the Gulf, where it is spread out in a fanlike shape over a coast line of 150 miles, and is filling up at the rate of 362,000,000 tons a year, or six times as much soil as was removed in the construction of the Manchester ship canal, and sufficient to make a square mile of new land, allowing for its having to fill up the Gulf to a depth of eighty yards.

Some idea of the vastness of this operation may be conceived when the fact is considered that some of this soil has to be transported more than 3000 miles, and that if the whole of it had to be carried in boats at the lowest rate at which heavy material is carried on the inland waters of America, or say for one-fifth of a cent per ton per mile over an average of half the total distance, the cost would be no less a sum than $1,190,000,000 a year. Through the vast delta thus formed the river winds its way, twisting and turning by innumerable bends until it exteuds its length to nearly 1200 miles, or more than double the point-to-point length of the delta, continually eroding the banks in one place and building up land in another, occasionally breaking its way across a narrow neck which lies between the two extremities, and filling up the old channel.

The canal system of France caused a disregard of distauce. Amongst the imports at Rouen is a eonsiderable quantity of feldspar from Norway. The chief part of this feldspar goes by lighters into the heart of France, into the department Loiret. There, upon the banks of the canal de Briare, is an immense button manufactory. Over 1500 men are employed in it, and the sewing of the buttons upon the cards on which they are sold all the world over gives occupation to many thousands of women and children in the surrounding country. Crushed up and set with milk, for which purpose more than 100 cows are kept upon the premises, this feldspar from the mountains of Norway serves as the material from which buttons are made.

The entire platinum output of the Ural Basin, a foreign journal announces, has been sold at a very high price for ten years ahead. Some years ago this metal cost 2700 roubles per pood of 36 English pounds. In 1893 an English firm acquired the decadal production of the Tagil mines at the price of 8000 roubles per pood. Now a French electrical company has concluded a contract with the remaining Ural mines for the supply of the ten years' output at the rate of 12,500 roubles.

Following are recipes for preparations to keep tools from rusting: Dissolve one-half ounce of camphor in one pound of melted lard; take off the scum and mix in as much black lead (grapite) as will give it an iron color. Smear the tools with this mixture, and after twenty-four hours rub clean with a soft linen cloth. Another coating is made by mixing slowly six ounces of lard to one ounce of resin, and stirring till cool. When semi-fluid it is ready for use.

A novel test of electric power as against steam was recently made on the Nantasket Beach road. A heavy train, to which was attached a locomotive at one end and a motor at the other, was used for the purpose, and both engine and motor pulled together in opposite directions. The electric motor pulled train and locomotive easily, despite the fact that the latter was under full head of steam and pulling against it.

Prof. Ramsay will soon have fresh facts of interest to announce regarding the new elements argon and helium. He recently tested several chippings from meteorites and found both elements present in all of them.

A French medical authority asserts that death caused by a fall from a great height is absolutely painless. The mind acts very rapidly for a time, then unconsciousness ensues.

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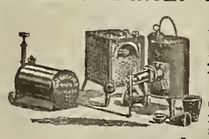
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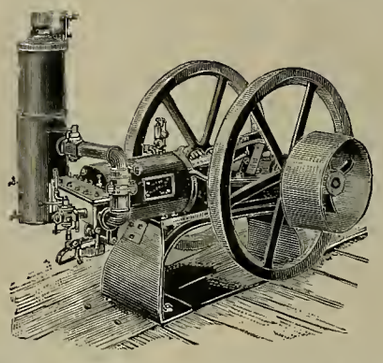
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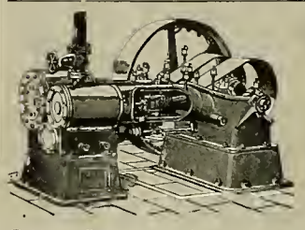
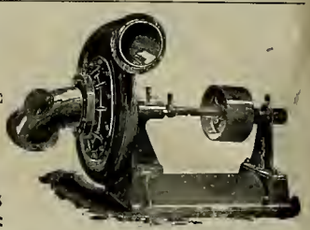
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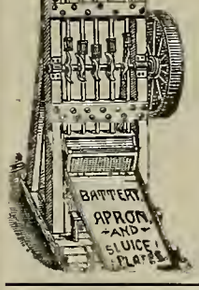
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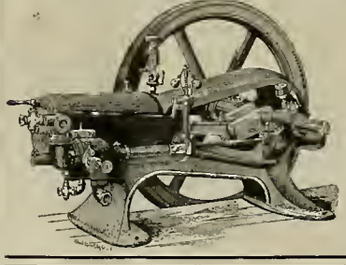
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Coal Oil, ten hours' run. 7½ gallons @ 10c	75
Crude Petroleum, asphaltum base, 16 gallons @ 3c	48
Crude Petroleum (36 deg.), paraffine base, 13 gallons @ 5c	65

On the crude petroleum with asphaltum base we had an over-product of 7 gallons of asphaltum; the market price is 3 cents per gallon=21 cents. This deducted from the first cost of the crude petroleum for ten hours' run leaves a net balance of 27 cents. And from the crude oil with a paraffine base we had an over-product of 3 gallons of good lubricating oil, which we consider equal to any we have ever used, but will estimate its value conservatively at 20 cents per gallon, making 60 cents; this deducted from the first cost of the crude oil leaves a balance of 5 cents, total cost of running ten hours.
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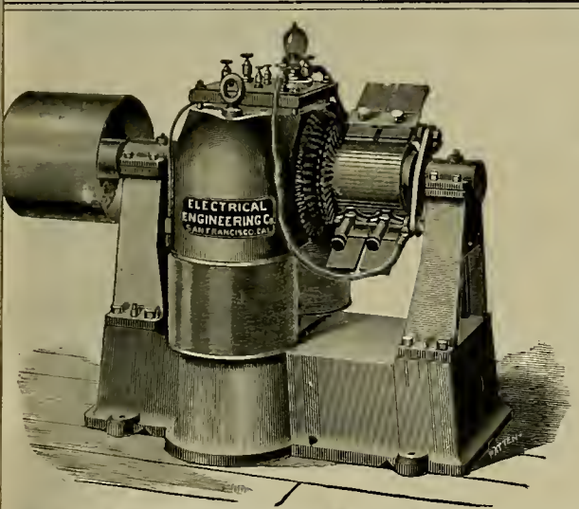
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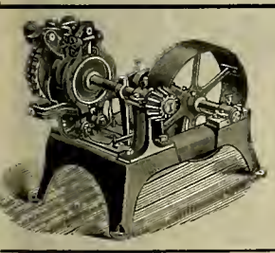
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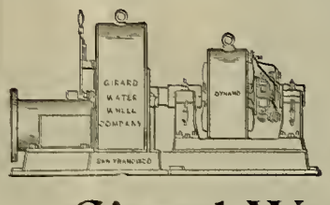
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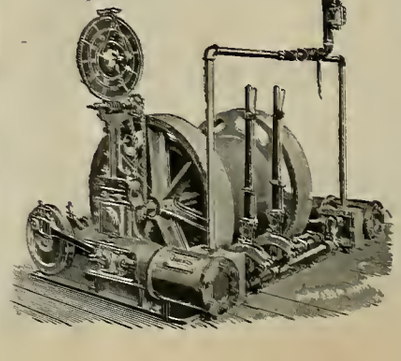
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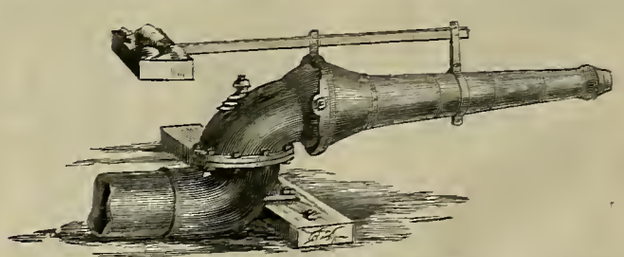
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Market Reports.

The Markets.

SAN FRANCISCO, Sept. 5, 1895.

Silver is steady; just about the same week after week. As nearly all the silver mines have closed down, the store diminishes. There is a foreign demand that is likely to enhance present figures. The useful metals are in greater prominence than the precious ones, and buoyant in price. The Western Bar Iron Association held a crowded conference at Cleveland, Ohio, last Tuesday, and decided to advance the price on all grades of bar iron $2 a ton.

The great activity in the electrical business has given copper a tremendous boom. Producers are now talking of fourteen-cent copper, as contrasted with ten cents a few months ago. Shortly will appear the strength of the market, as the heaviest producers will next week be again in the market with copper to sell.

New York Metal Market.

NEW YORK, Sept. 5.—PIG IRON—Southern, 11.50@14c; Northern, 12@14c.

COPPER — Brokers', 12.20 @ 12.25c; exchange, 12.10@12.15c.

LEAD—Brokers', $3.30; exchange, $3.50.

TIN—Straits, 14.40@14.55c.

SPELTER—Domestic, $4.20.

New York Silver Prices.

NEW YORK, Sept. 5.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.
Friday	30½	67	11 80	.....
Saturday	30½	66¾	11 85.	3 37½
Monday	30½	66¾	.....	3 37½
Tuesday	30½	66¾	.....	.....
Wednesday	30⅝	66⅞	11 95	3 40
Thursday	30¾	67	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.89
London Merchants	$4.87½
London Sight Bankers	$4.90
Refined Silver, per ounce	67c
Mexican Dollars, nominal	54c

San Francisco Metal Market.

COPPER.

Bolt	¼ & 5-16, 19c; ⅜ and larger, 19c		
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	16	@	15
Sheet copper	—	@	20

ZINC.

Sheet	9	@	

LEAD.

Pig	—	@	4 00
Bar	—	@	4 10
Sheet	—	@	5 35
Pipe	—	@	4 85

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "	"	...	1 45
Buck, Balls and Chilled, do, "	"	...	1 45

IRON.

American Soft	15 00	@	17 00
Pig, per ton	16 00	@	19 00

STEEL.

English, lb	15	@	17

ANTIMONY.

Per lb	—	@	10

PIG TIN.

Per lb	15	@	16 00

QUICKSILVER.

Home trade, per flask	41 00	@	— —

TIN PLATE.

Per bx	5 25	@	6 00

ZINC.

Sheet	8¼	@	

BORAX.

Refined, in car lots	—	@	5⅛
Refined, in sacks and barrels	—	@	5¾
Powdered, in car lots	—	@	5¾
Concentrated, "	—	@	4⅞

COAL.

SPOT FROM YARD—PER TON.

Wellington			$ 8 50
Greta			7 50
Nanaimo			7 00
Gilman			6 50
Seattle			7 00
Coos Bay			5 50
Cannel			8 50
Egg, hard			13 00
Wallsend			7 50
Scotch Splint			8 00
Brymho			8 00

TO ARRIVE—CARGO LOTS.

Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

COKE.

Gas Companies'			75c ₩ bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —

NAILS.

Wire			$2 30
Cut			2 00

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, September 5, 1895.

The stock market was a heavy one this week. The denial by the Supreme Court of the motion of the defendants for a rehearing in the Hale & Norcross case sent that stock from $1.75 to $1.90 and stiffened some of the others a little. On Thursday the stock ran down from $1.80 to $1.65, and closed at $1.55, while the other stocks exhibited more strength and activity.

Sales at the regular sessions of the San Francisco Stock and Exchange Board for the mouth of August were 229,850 shares, and for the first eight months of the year 1,924,275 shares, as against 2,770,560 shares during the same time in 1894. The total for the same time in 1893 was 2,084,005 shares.

Mention was made last week that Supts. Lyman and Messer had gone to the Comstock to look at the Concordia and Monte Cristo claims on the Brunswick, which the Ophir and Mexican thought of buying. An adverse report has been filed.

The following is the usual monthly statement of moneys on hand:

BONIE MINES.		Crown Point	$10,844 00
Bodie	$ 9,708 00	E. Sierra Nev.	82 00
Bulwer	2,304 00	Exchequer	1,386 00
Mono	3,053 00	Gould & Curry	8,763 00
Standard	28,945 00	Hale & Norc'ss	9,853 00
Syndicate	988 00	Julia	991 00
WASHOE MINES.		Lady Wash'n	899 00
Alpha	$ 3,391 00	Mexican	14,459 00
Alta	2,069 00	Occidental	2,081 00
Andes	7,301 00	Ophir	16,300 00
Belcher	12,928 00	Overman	6,229 00
Best & Belcher	11,073 00	Potosi	1,089 00
Bullion	6,801 00	Savage	.....
Caledonia	2,451 00	Scorpion	105 00
Challenge	1,749 00	Seg. Belcher	507 00
Chollar	18,380 00	Silver Hill	1,091 00
Con. Cal & Va	26,178 00	Sierra Nevada	5,229 00
Confidence	4,017 00	Union Con	17,818 00
Con. Imperial	554 00	Utah	4,629 00
Con. New York	1,245 00		

The following illustrates the changes of the week:

MINES.	Aug. 29	Sept. 5
Alpha	$ 10	$ 16
Alta Consolidated	14	12
Andes	33	33
Belcher	57	55
Best & Belcher	1 05	1 00
Bodie	15	12
Bullion	.....	18
Challenge	63	75
Choliar	62	60
Confidence	1 85	1 75
Consolidated California and Virginia	2 80	2 65
Consolidated New York	.....	.....
Crown Point	54	52
Exchequer	02	04
Gould & Curry	55	54
Hale & Norcross	1 80	1 70
Justice	07	.....
Mexican	63	67
Ophir	1 60	1 60
Overman	20	19
Potosi	65	58
Savage	45	40
Sierra Nevada	45	78
Union	53	57
Utah	07	.....
Yellow Jacket	43	42

San Francisco Stock Board Sales.

SAN FRANCISCO, Sept. 5, 1895.

9:30 A. M. SESSION.

100 Alta	12	100	1 70
100 Andes	33	1000 Kentuck	03
100 Belcher	54	400 Mexican	65
200 Best & Belcher	1 60	200 Ophir	1 55
100	99	200 Overman	18
100 Bullion	18	100 Potosi	58
400 Challenge	65	100 Savage	40
100 C. C. & Va	2 65	100 S Belcher	11
50 Crown Point	50	100 Sierra Nevada	73
600 Gould & Curry	53	50 Union	54
150 H & N	1 65	200 Yellow Jacket	40

SECOND SESSION—2:30 P. M.

200 Ophir	1 60	500 Belcher	55
100 Mexican	66	200 Confidence	1 75
300	67	350	1 70
200 G. & C	54	450 Sierra Nevada	77
200 Best & Belcher	1 00	200	78
400 Savage	39	300 Exchequer	04
200 Chollar	60	400 S Belcher	12
50 Con Cal & Va	2 65	100 Overman	19
250 Hale & Norcross	1 65	200 Union	57
50	1 70	600 Challenge	74
300 Crown Point	52	100	73
200 Yellow Jacket	42	300	75
1000 Con. Imperial	03	100 Andes	33
600 Alpha	16	150 Bodie	12
200	15		

Sampling Works for Sale.

The works are situated at Daggett, Cal., in the Calico Mining District, and on side track of the Atlantic & Pacific Railroad. They contain a first-class 50-horse power Engine and 45-horse power Boiler, with Ore-crusher and other machinery, Mill Scales, Assaying Outfit, etc., all nearly new. Also upon the premises an office building and a comfortable dwelling-house (portable). The above can be had at a bargain. Apply to JOHN H. GILLESPY, 1906 Stockton St., San Francisco.

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ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Belcher S M Co., Nev	51	25c	July 16, Aug 20, Sept 10	C L Perkins, Mills Building
Bodie Con M Co, Cal	18	15c	Aug 13, Sep 16, Oct 7	M E Willis, 309 Montgomery
Con Imperial, Nev	36	1c	Aug 5, Sept 12, Oct 3	C L McCoy, Mills Building
Evening Star M Co, Cal	19	1c	Aug 5, Sept 10, Sept 22	J J Scoville, 320 Sansome
Kentuck Con, Nev	11	10c	Aug 6, Sept 10, Oct 1	Aug Waterman, 309 Montgomery
Mono M Co, Cal	35	10c	July 16, Aug 15, Sept 10	M E Willis, 309 Montgomery
Sierra Nevada S M Co, Nev	109	25c	July 30, Aug 30, Sept 23	E L Parker, 309 Montgomery

Coast Industrial Notes.

—The Vulcan Iron Works is finishing a large double circular sawmill plant for South America.

—Stockton is endeavoring to secure the removal of the plant of the California Jute Mills from Oakland to that place. The mills in operation employ about 350 hands.

—At Signal, Mendocino Co., is established the first factory in this State for the manufacture of tannin extract. The ground bark is leached and the liquid evaporated.

—The Santa Clara Valley Railway Co. has incorporated, capital stock $100,000, to build a railroad eight miles from Alviso at the head of the bay to San Jose. A line of steamers will run from the former point to this city.

—The Fresno Board of Trustees have granted a franchise to the San Joaquin Electric Company for fifty years. The company proposes to bring power from the San Joaquin river to light the city and drive its cars and machinery, and has over 100 men at work.

—The current number of *Cassier's Magazine* has a well-written article on "Steam Engines of To-day," which, among its illustrations, has one of a sectional Corliss engine built by the Fulton Engineering and Shiphuilding Works and one of a slide-valve Corliss engine built by the Golden State and Miners' Iron Works.

—A man is engaged at Grass Valley in burning refuse bones. After the animal substance is burned out of the bones the charred and bleached remnants are sacked up and sent to San Francisco, where he receives from $20 to $60 per ton for the results of his labors. This bone product is used largely for the clarifying of sugar.

—A San Francisco man has bonded one of the old collieries on the northeast bank of Mount Diablo, and he proposes now to reopen the mine, establish a big steam electric plant, run wires to Oakland and furnish power to that city and all way stations. He says that the coal can be taken out of the Mount Diablo mines and put under the boilers for $1 a ton.

—The late J. C. Wilmerding of this city gave $400,000 in trust to the regents of the State University to establish "a school to teach boys trades by which they can earn a living with their hands, with plenty of work and not too much study." The money has been paid to the trustees, who will select a site and endeavor to comply with the testator's wishes.

—The Alcatraz Asphaltum Mining Company's refinery at Carpenteria, Santa Barbara Co., is lighted throughout by electricity and operated by a large force of men. Fifty-five men engaged in surface mining at the Carpenteria deposits are taking out 800 tons a month. The company has thirty men at the La Paera mines, ten miles west of Santa Barhara, taking out 700 tons monthly.

RUPTURE CURED!
NO DANGER. NO OPERATION. NO PAIN.
No Detention from Business.
QUICKLY! PERFECTLY! PERMANENTLY!
NO PAY UNTIL CURED.
J. C. ANTHONY, M. D.,
San Francisco Offices, Suite 86 and 87, Chronicle Building.

AMERICAN CONDENSED MILK COMPANY
WESTERN AMERICAN
99
BRANDS
SAN FRANCISCO

★ C. H. EVANS & CO., ★
(Successors to THOMSON & EVANS.)
110 & 112 BEALE STREET, S. F
MACHINE WORKS,
Steam Pumps. ✦ Steam Engines.
. . All Kinds of MACHINERY . .
:: DEEP WELL :: PUMPS!



Assessment Notices.

KENTUCK CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the sixth day of August, 1895, an assessment (No. 11) of Ten (10c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room No. 23, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the tenth day of September, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on TUESDAY, the first day of October, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

AUG WATERMAN, Secretary.

Office—Room No. 23, Nevada block, No. 309 Montgomery street, San Francisco, California.

FAIRFAX VILLA COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Fairfax, Marin County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of August, 1895, an assessment, No. 4, of Fifty Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 56, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of September, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 21st day of October, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, Room No. 56, No. 309 Montgomery street, San Francisco, California.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 23d day of August, 1895, an assessment, No. 3, of 2½ cents per share was levied upon the whole of the capital stock of the corporation, both paid and unpaid, payable immediately in United States gold coin to the Secretary, at the office of the company, 213 Jackson Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of October, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 28th day of October, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$ 00 00
M. J. McDonald, Trustee	295	1,000	100 00
M. J. McDonald, Trustee	296	1,000	100 00
M. J. McDonald, Trustee	298	1,000	100 00
M. J. McDonaid	453	250	25 00
M J. McDonaid, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
C. D. Rixford, Trustee	145	1,000	100 00
Mrs. Hattie C. Baggs	529	201	20 10
G. W. Lnee, Trustee	382	347	34 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	444	200	20 00
Geo. Dillman	530	980	98 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	454	45 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4,000	400 00
Montgomery Baggs	528	100	10 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock, P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

WANTED!
A Gold Quartz or Copper Property,
With sufficient development work done to show up the property. Must stand a thorough and complete examination. None but a first-class property wanted. All information will be strictly confidential with buyer only. Send full particulars of property for sale.
M. KNOX,
12 Front Street.....San Francisco, Cal.

INVENTORS, Take Notice!
L. PETERSON, MODEL MAKER,
226 MARKET ST., N. E. Corner Front (Up Stairs), SAN FRANCISCO. Experimental machinery and all kinds of models. Tin and brasswork. All communications *strictly confidential*.

LIGHTNING LARGEST WELL MACHINERY Works.
All kinds of tools. Fortune for the driller by using our Adamantine process; can take a core. Perfected Economical Artesian Pumping Rigs to work by Steam, Air, etc. Let us help you. THE AMERICAN WELL WORKS, Aurora, Ill.; Chicago, Ill.; Dallas, Tex.

In the new mechanics building of the University of California at Berkeley there are a number of very valuable instruments delicately adjusted for accurate experimenting. One of these is a recently invented machine for testing lubricating oils. In the East almost all of the determinations are made at the technical colleges and there is no reason why it should not be done here. Mr. Cheseborough, the machinist at the laboratory, held a similar position in the machine shops at Cornell University and is especially fitted for this kind of work. He has already made a number of valuable experimental tests for governmental officials here and there is no reason why oil producers throughout the State should not send in their samples and avail themselves of the well-equipped laboratory in determining the value and uses of their oils.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING AUGUST 27, 1895.

545,217.—STREET CAR BRAKE—H. T. Atkinson, Oakland, Cal.
545,222.—PRESERVING TIMBER—Curtis & Isaacs, S. F.
545,065.—THILL SUPPORT—W. L. Frazer, San Diego, Cal.
545,228.—HORSE-BREAKING APPARATUS—J. W. Green, Cotati, Cal.
545,291.—FARE REGISTER—S. C. Houghton, S. F.
545,298.—ELECTRIC RAILWAY—C. H. Johnson, San Jose, Cal.
545,164.—CABLE COUPLING—J. P. F. Kuhlmann, Seattle, Wash.
545,138.—VEHICLE—J. R. Simms, S. F.
545,319.—LOG-HAULING DEVICE—Van Duzer & Kirry, Scotia, Cal.
545,320—SPRINKLER—J. P. Van Sicklo, Pasadena, Cal.
545,183.—SAUCEPAN—R. B. Vanderhurgh, Long Beach, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DEVICE FOR SAVING VALUABLE AND PRECIOUS METALS.—James A. Bouk and Charles Bushnell of Santa Cruz, Cal. No. 544,880. Dated Aug. 20, 1895. The object of this invention is to save that portion of precious and valuable metals which is lost in passing over amalgamating plates and concentrators, and which escape in the form of chlorides and fine float, as well as sulphurets which are too fine and light to readily settle, these being technically called "slimes." The apparatus consists of a water-containing tank; an endless traveling belt having one end submerged therein, with means for delivering the ore upon the submerged end of the belt; spray pipes delivering water upon the belt after it has emerged from the tank, to cleanse the heavier portions and leave the slimes and soluble portions remaining within the tank; settling tanks and connections whereby the solution and slimes are delivered directly and continuously from the main tank to the settlers; a filter whereby the insoluble portions are arrested within the settling tanks and the solution allowed to pass therefrom, and means for again transferring the solution upon the belt and through the settling tanks until sufficiently charged with soluble matter for further treatment.

GAS ENGINE AND GENERATOR.—Daniel Best, San Leandro, Cal. No. 544,879. Dated Aug. 20, 1895. The object of this invention is to provide a convenient means for supplying an explosive gas or vapor to a gas engine directly from the crude petroleum or hydrocarbon supplying the hydrocarbon to the generator in small continuous charges, and removing the residue as fast as it accumulates. It consists of a vertically disposed generator consisting of an exterior case, an interior series of superposed and connected cones extending throughout a casing with a vertical central passage communicating at one side by its lower end with the passage from the exhaust of an engine; an opening through the top to the exterior case, a pipe by which the hydrocarbon is delivered upon the uppermost of the conical surfaces so that the liquid flows over the surfaces in a thin sheet and is acted upon and vaporized by the heat of the products of combustion from the engine escaping through the interior of the cones.

AMALGAMATOR.—George H. Chick, San Francisco, Cal. No. 545,011. Dated Aug. 20, 1895. This invention relates to an apparatus especially designed for saving precious or valuable metals where they occur in a finely divided condition, mixed with fine sand or tailings. It consists of rotary agitating and collecting cylinders in suitable containing chambers, these cylinders turning on horizontal axes having silvered or amalgamated cups fixed upon the periphery in series so that they open alternately in opposite directions and are adapted to dip into the pulp contained within the chamber or casing in which the cylinder rotates, so as to agitate the pulp and bring the material into intimate contact with the silvered or amalgamated surfaces. In conjunction with this is a preliminary receiving chamber into which the pulp is delivered, and agitators by which it is stirred up before being delivered into the main chamber.

WASHBURN & MOEN MFG. CO.

MAKERS OF

BARBED BALING COPPER INSULATED WIRE ROPE NAILS SPRINGS BALE TIES

WORKS: WORCESTER, MASS., WAUKEGAN, ILL., SAN FRANCISCO, CAL.

SAN FRANCISCO OFFICE: 8 AND 10 PINE STREET.

FRANK L. BROWN, PACIFIC COAST AGENT.

THE I. B. HAMMOND CO.

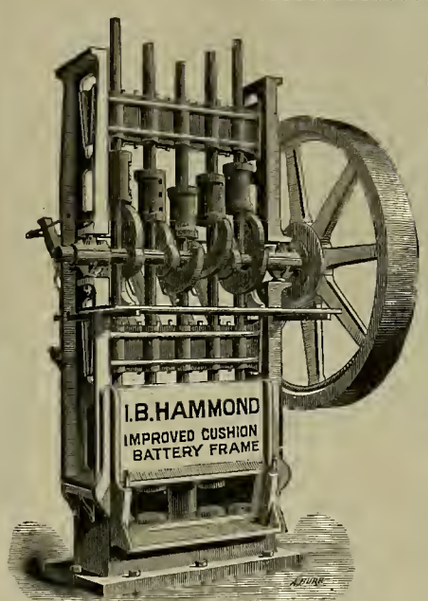
69 First Street, PORTLAND, OR.

MANUFACTURERS OF

Stamp Mills, Ore Feeders

DETACHABLE BUCKET WIRE-ROPE TRAMWAYS,

Roller Grinding Pans, Desulphurizing Furnaces, Etc.



Improved Self-Contained Cushion-Frame Five-Stamp Mill.

The Improved, Iron-Frame, Self-Contained, Cushion-Frame, Five-Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space. The term "Self-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

FIRST: There is Saved by the Use of This Mill a Large Bill for Heavy Timbers, in Many Instances Obtained at Great Expense and Loss Of Time.

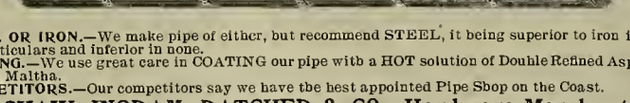
SECOND: The Saving in Mill-Wright and Mechanics' Labor in Framing and Erecting.

THIRD: The Large Amount of Space Saved.

We refer by permission to Mr. N. A. McMillan, Haines, Oregon, manager of the Blue Mountain Mining Co., at Rock Creek, Or., where ten of our stamp mills are in operation; also to Mr. John S. Miller, Helena, Montana, manager of the Diamond Hill Mining Co., operating one of our forty-stamp mills at their mines at Townsend, Montana.

Send for Catalogue and Price List. CORRESPONDENCE SOLICITED.

Mining Pipe!



STEEL OR IRON.—We make pipe of either, but recommend STEEL, it being superior to iron in many particulars and inferior in none.
COATING.—We use great care in COATING our pipe with a HOT solution of Double Refined Asphaltum and Maltha.
COMPETITORS.—Our competitors say we have the best appointed Pipe Shop on the Coast.

SCHAW, INGRAM, BATCHER & CO., Hardware Merchants,
SACRAMENTO, CAL.

DROP FORGED MINER'S SPOON. Sample by Mail, 10c.



THIS CUT ONE-HALF SIZE.

Manufactured by COLUMBUS BOLT WORKS, Columbus, Ohio.

MINE BELL SIGNALS.

Adopted, Used and In Force in Accordance with State Law.

FOR THE CONVENIENCE OF OUR READERS IN THE MINING COUNTIES WE PRINT IN legal size, 12x36 inches, the Mine Bell Signals and Rules provided for in the Voorbies Act, passed by the State Legislature and approved March 8, 1893. The law is entitled "An Act to Establish a Uniform System of Mine Bell Signals to Be Used in All Mines Operated in the State of California, for the Protection of Miners." We furnish these Signals and Rules, printed on cloth so as to withstand dampness, for 50 cents a copy. MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

WIRE ROPE
FOR ALL PURPOSES
WIRE ROPE TRAMWAYS.
IRON & STEEL WIRE
TRENTON IRON CO
TRENTON, N.J.
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AGENT IN SAN FRANCISCO:
NEWTON M. BELL, 109 California Street.

A Full Assortment of Wire Rope for Mining Purposes carried in San Francisco.

THE WILSON
HIGH GRADE STEEL



SHOES —AND— DIES.

Guaranteed to Wear Longer and Prove Cheaper than any others.

Made by use of Special Appliances.

PATENTED AUGUST 16TH, 1892.

— Made only by —

Western Forge and Rolling Mills,

ST. LOUIS, MO.

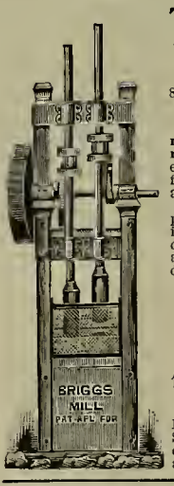
WM. A. HEWITT, - - Agent,

11 and 13 First St., San Francisco.

The Briggs

TWO-STAMP MILL,

850-lb. stamps; weight of mill, 6000 lbs.



The most substantial mill ever offered to miners; discharges both ends and front; will crush from 6 to 10 tons per day; any one can set it up.

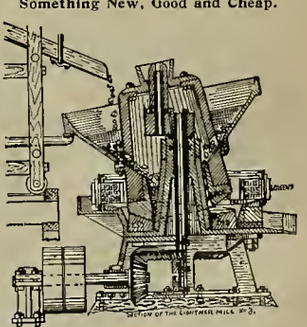
Complete as per cut, price $450.00. This mill is furnished with 9-inch cast steel shoes and dies, and substantial independent iron guides.

Western Manufacturing Company,

114 and 116 Mission St., San Francisco,

Builders of all kinds of Saw Mill and Mining Machinery, Engines, Boilers and Special Machinery.

THE LIGHTNER QUARTZ MILL.
Something New, Good and Cheap.

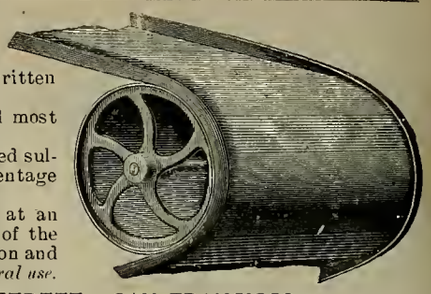


MANUFACTURED BY
WM. H. BIRCH & CO.
Also Manufacturers of
Cary Steam Pumps, All kinds of Mining Machinery, Boilers, Engines, Ore Buckets, Ore Cars, Cages, Hoists, etc.
119 Beale St., San Francisco.

Hydraulic Mine for Sale.

Not on a navigable stream; in northern California. Good dump; no trouble with tailings; 180 acres of mining ground; 5000 inches of water. Can work eight months in the year. Ample opportunity given a buyer to fully test the property before payment is made. For further details,
Address X, 2022 W St., Sacramento, Cal.

THE BLASDEL IMPROVED ORE CONCENTRATING BELT.



We are now having our belts made by the best rubber manufacturers in New York and Boston, under written guarantees both as to quality and mechanical construction.

We have been granted two United States patents for improved devices in concentrating belts, the first and most important of which is for a slight riffling of the surface at intervals and crosswise of the face of the belt.

While these riffles are only about one-thirty-second of an inch in depth, they are very effective in saving floured sulphurets and reclaiming quicksilver and amalgam that may escape from the plates, thus gaining a large percentage of values that would go off with the tailings from belts with entirely smooth surfaces.

Our second patent is for an improvement in the flanges which practical mill men will appreciate. They stand at an acute angle inwardly, therefore they thoroughly confine the pulp on the belt; and in passing over the end pulleys of the machine, lie partly down, consequently do not crack or break, as do the old-style flanges; thereby much vexation and loss is avoided. *We keep in San Francisco and New York belts of all lengths and widths suitable for all concentrators in general use.*

BLASDEL CONCENTRATING BELT CO., HAYWARDS BUILDING, 419 CALIFORNIA STREET, SAN FRANCISCO.

RISDON IRON WORKS.

Office and Works: Cor. Beale and Howard Sts., San Francisco.

Cable Address: "RISDON'S" San Francisco.

MANUFACTURERS OF

Johnston's Concentrator, Improved Bryan Mills,

Challenge Ore Feeders, Air Compressors,

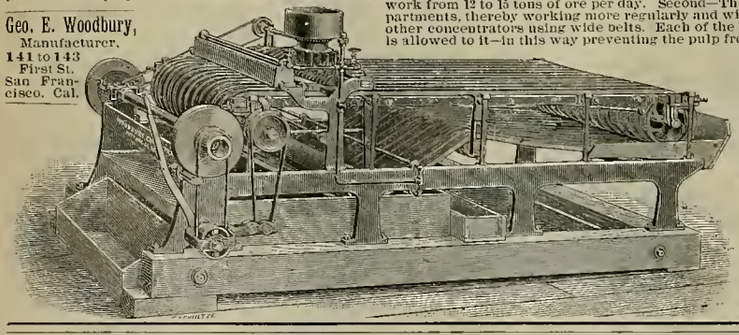
KNIGHT WATER WHEELS—Highest Efficiency Guaranteed.

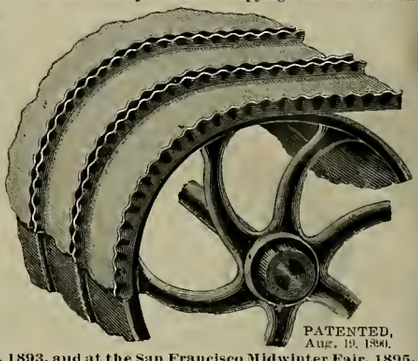
MINING, MILLING, PUMPING and HOISTING PLANTS.

THE WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891 MORE THAN DOUBLE THIS CAPACITY with one-half less power and occupying less than one-half the space of any other concentrator. Built of best Steel and Wrought Iron. Strong and durable. **Price $575 f. o. b.** Send for Catalogue and Testimonials.

The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect; Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

Geo. E. Woodbury, Manufacturer, 141 to 143 First St. San Francisco, Cal.





PATENTED, Aug. 19, 1890.

This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1895.

FULTON ENGINEERING ++AND++ SHIPBUILDING WORKS.

MINING AND MILLING MACHINERY,

ADAPTED TO EVERY DESCRIPTION OF MINING AND MILLING.

Office and Branch Works, - - - - - - 213 First Street, San Francisco, Cal.

The Edward P. Allis Company, Milwaukee, Wis.

Established 1860. Reliance Works.

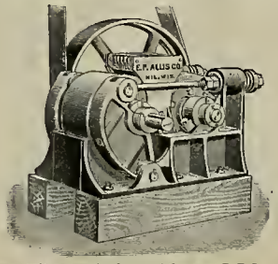
MINING, MILLING AND SMELTING MACHINERY.

Crushers, Rolls, Jigs, Concentrators, Screens, Stamps, Pumps, Compressors, Hoists, Boilers, Etc., Etc.

Reynolds Corliss Engines.

WORK THE BEST. PRICES THE LOWEST.

The Reliance Crushing Rolls.



The Best in the World.

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San Francisco, Cal.	9 Fremont Street.
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Salt Lake City, Utah	73 So. Main Street.
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Minneapolis, Minn.	416 Corn Exchange.
Chicago, Ill.	509 Home Ins. Building.
Kansas City, Mo.	43 Armour Building.
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New York City	26 Cortlandt Street.
City of Mexico	Calle Gante, No. 12.

WRITE FOR OUR NEW CATALOGUE.

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MINING AND SCIENTIFIC PRESS.
AND PACIFIC ELECTRICAL REVIEW.

OLUME LXXI. Number 11. SAN FRANCISCO, SATURDAY, SEPTEMBER 14, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

hree-Phase Long Distance Electrical Transmission for Mining Work.

An important applicatiou of the three-phase system of long distance transmission of power has recently heeu installed and put in operation at ic Silver Lake mines, near Silverton, Col., here power is transmitted a distance of three iles through some of the roughest country in olorado. It is attracting considerable attenon among mining men, as it is the first threehase plant installed in the Rocky mountain reion. The success of direct curreut transmission as been thoroughly demonstrated by transission plants operating in California, Colorado nd elsewhere. The expense, however, insepaable from direct current transmission, preludes the utilization of that system in some laces where the distance exceeds a certain mited number of feet. Where 100 H. P. can e transmitted by direct current one mile at 00 volts, ten per cent being allowed for loss the line, it is claimed by Irving Hale nd other authority that the copper wire ecessary will cost about $2000, aud for the ame horse power transmitted by the same syem for ten miles about $200,000. The threehase current at 500 volts employed to transit the 100 H. P. for ten miles would, it is laimed, make the cost not more than $2000; hat is, the originators and commercial operators of the three-phase system claim that a iven horse power can he transmitted hy the threehase system at 5000 volts, ten times farther than a imilar horse power hy the direct current system at 00 volts for the same expenditure in copper. The uestion of dollars and cents is a prominent factor in all transmission nstallations and the three-phase ystem, where long distance transmission is concerned, is thus asserted to be the most practical system because the most economical. The installation at Silverton is a striking example.

The Silver Lake group of mines lies four miles southeast of Silverton, at an altitude of 12,300 feet. They are owned hy Edward S. Stoiher. The ore mined carries hoth gold and silver, is of a comparatively low grade and requires concentration.

Previous to the installation of electricity the mill, situated on the shore of the lake near the mouth of the mine tunnel, was run hy steam. Coal was brought to the steam engine by the zig-zag path up the mountain shown in Fig. 1, and by the time it reached the furnace cost $8.75 a ton. This represented a monthly expenditure of almost a thousand dollars, and the expense proved a burden which went far to eat up the profits of the mine. Reform, therefore, hecame imperative.

The plant is now operated hy water power, which is brought from the Animas river, above Silverton, through a 3x4-foot flume 9750 feet in length, with an estimated duty of 2350 cubic feet per minute. Flume and trestle are shown in Fig. 2. One great advantage of clectrical utilization is here shown, for it was found less expensive to build this costly two-mile flume, running from above Silverton down to a spot where necessary head could be utilized, and



FIG. 1.—THE ZIG-ZAG TRAIL UP THE MOUNTAIN.

then to transmit the electricity back to the mine, than to continue to burn coal at the price which it brought at the mouth of the Silver Lake mines.

The head of water obtained is about 180 feet; this

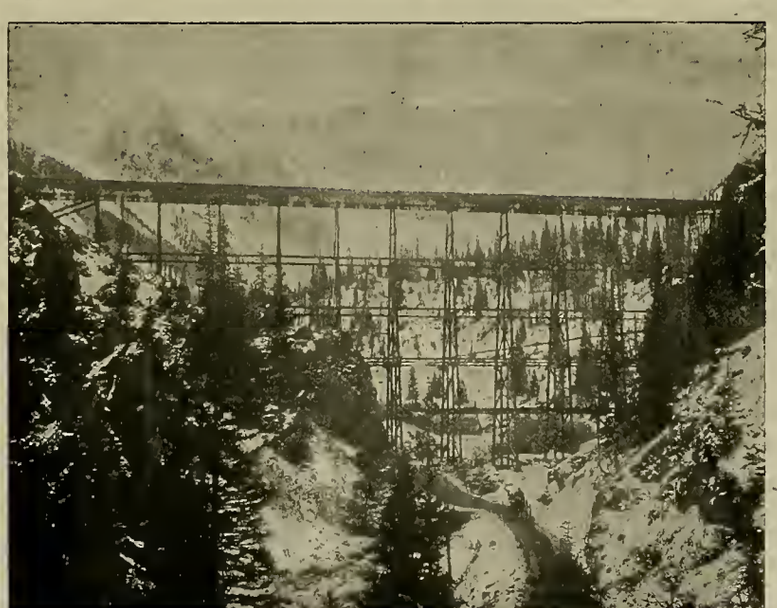


FIG. 2.—THE FLUME.

develops on the water-wheel shaft 640 H. P. The plant consists of two four-foot double nozzle Pelton water wheels, with special huckets, belt connected to two 150-K. W. (200-H. P.) General Electric three-phase generators.

The current from these machines is given out at 2500 volts and is transmitted over a distance of a little more than three miles to the Silver Lake mill and mine. The conductors are No. 3 B. & S. bare copper wires, one for each brauch of the three-phase circuits. These are strung from the power house, shown in Fig. 3, on page 169, up the mouutain passes and through the rugged country shown in the illustrations. In one place where a chasm has to be spanned the wires leap from pole to pole a distance of 275 feet. They have been strung with especial care, as hefitted the ahnormal conditions. At each insulator the wire is run through a short piece of ruhber tube as an extra precaution against leakage. Lightning arresters are placed at each end of the line and an additional safeguard against possible damage by lightning is provided in the shape of a barhed iron wire, which extends the entire distance of the line along the tops of the poles and is grounded at every second pole. In that country, where the storms are frequent and the lightning disastrous in its effects, every precaution is taken to frustrate possible damage from atmospheric discharges. The most effective lightning arresters which have been found for this work are those which the General Electric Company itself manufactures, although every other kind has been tried.

In the winter time the snow lies thickly on the grouud and all the intercourse hetween the mine and civilization is almost cut off. Some idea of the difficulties of the road may be gathered hy referring to Fig. 1, where the zig-zag route up the side of the mountain is shown.

Arriving at the mine the current is supplied to a 100-H. P. three-phase induction motor run directly from the primary circuit. Another 100-H. P. motor, as well as one of 75 H. P., are located heneath the ground and current is supplied to these at a pressure of 220 volts, the reduction in pressure being effected hy step-down transformers. In addition, a 15-H. P. motor runs a pump raising water from the lake to the mill, and oue small 1-H. P. motor operates a blower and the lights for a bunk, office and other buildings, hoth being connected to the secondaries.

The induction motor used is an excellent representation of the latest type of alternating current motor built by the General Electric Co. There are no commutators, collector rings or hrushes; the field winding is connected to the circuit, hut there is no connection hetween the armature and any external source of current. The three-phase curreuts, rising and falling in the field windings, induce corresponding currents in the armature winding and the armature revolves. The field armature cores are so completely laminated that all loss from eddy currents is practically eliminated. The speed of the motor is at all loads practically constant. The starting resistance for preventing any excessive

(Continued on page 169.)

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J. F. HALLORAN.....General Manager

San Francisco, September 14, 1895.

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THE greatest present demand for mining machinery is at the Witwatersrand, South Africa, where a new eighty or one hundred stamp mill is a weekly occurrence. It is calculated that in the next four months 1000 new stamps will be added to the 2745 now in operation in that busy gold region.

THE editorial leader in the South African *Mining Journal* of July 27th is a three-column article regarding this journal and its notices of South African gold mines, in which strenuous objection is made to the quantity and quality of such information, and general adverse criticism is made as to its accuracy. It seems the chief front of our offending is the republication of an item concerning Cecil Rhodes, culled from the columns of our esteemed African contemporary, aud the publicity given herein regarding the stock jobbery—to speak mildly—now going on in South African mining shares in London and Paris. The *Mining Journal* closes its long complaint with the belief that the PRESS must either be "jealous" or else "willfully misrepresents." In its chosen field the PRESS collects and publishes a great deal about the South African gold fields, the same as any other section or region where metal mining of any kind is carried on. Nearly every issue of this paper has the latest procurable data concerning the gold output and what is being done; and the fact that the Johannesburg region is so large a contributor to the world's gold yield, coupled with the further fact that it is California miners who so largely direct and control that work, make the matter of considerable interest to our readers. The information thus published is compiled from correspondence personally received, from statements appearing in our complaining contemporary, from official reports sent by those in authority, and other reputable sources. There is no "jealousy" nor "willful misrepresentation," and it seems puerile for the South African *Mining Journal* to make such silly assumption. "Jealous" of what? What differeuce can it make to this paper or the mining industries of this State or coast whether the Randt gold yield is ten thousand ouuces or ten million ounces per month? And why need there be any suspicion of "willful misrepresentation"? What could be made or gained or what cause, good or bad, served by such course? The only desire on the part of the PRESS is to give the facts in such brief and intelligent shape as to be of value and interest to its readers. This journal has its opinions on matters of mine methods and stock manipulations and is not slow to express them. If they are not in unison with our South African contemporary, while it may be a matter of mutual regret, yet it is here courteously suggested that if the Johannesburg paper will point out any specific error or answer by adduced fact any opinion deemed wrong it will be accorded notice commensurate with justice.

Electricity at Sacramento.

The industrial event of the week has been the electrical display at Sacramento. The occasion was the celebration of the forty-fifth anniversary of California's statehood by State delegations of California "Native Sons," and was most fittingly utilized by the State capital city to exemplify the possession of one of the greatest electrical plants in the world. So much has been published in these columns descriptive of the creative force brought from Folsom that it is here unnecessary to repeat well-known details.

The chief significance of last Monday's celebration is the fact that a great handicap has been removed and that high-priced fuel is no longer so important a factor in the production of power in this State. The success of the great scheme points the way to other similar successes at places equally as well situated. The Sacramento-Folsom transmission is a colossal pioneer in this industrial revolution, and thus, the date of last Monday's celebration marks an era in State industrial conditions.

At Buffalo, New York, the Cataract Electric Co. proposes to successfully compete with coal at $1.50 per ton. At Sacramento the Electric Power Co. has better assurance of successful competition, with coal at $8 per ton.

The following is from the Sacramento *Bee* of the 10th inst.:

Last night the fair city of Sacramento celebrated by a spectacle original in conception, unique in design, and so beautiful and magnificent in its effects as to entrance the 20,000 visitors within the city's gates, and astonish even her own citizens, an event which means much for this city and much for the world. In Sacramento has been first practically solved the grave problem of the long transmission of the electric current for power and light purposes; and from the Folsom dam—twenty-two miles away, where the great turbine wheels of the Folsom Water Power Company, under the propelling force of the falling waters of the American River, generate electricity in four immense one-thousand horse power dynamos—bas been flowing to this city, since the 12th day of July last, the wonderful current that threatens to supplant steam for power, gas for light, and coal for heat.

In defiance of the predictions of many electrical experts the current, since that date, bas steadily traveled to Sacramento with a loss, because of transforming and transmission, between the great dynamos at tbe dam and the motors that furnish power at Sacramento city, of but ten per cent, or a total loss between the turbine wheels and the consumer of power of less than twenty per cent. This current has continuously, since the date named, moved the entire electric car system of this city, and, through the Sacramento Electric Power and Light Company, is now offered to move all the factory wheels of this city and supply its lights.

Not only is this the longest power transmission line in the world, but it is also the largest electric-power plant in the world, in the sense of the power actually developed. The turbines, dynamos, transformers and transmission line are now in place and ready for work, with a capacity of 4000 horse power actually delivered for use in this city. And this capacity can be more than doubled when the necessity arises.

Because of the grave doubts as to the possibility of successfully transmitting for a long distance, and using, without prohibitory loss, such a current, the eyes of the electric world for a year past have been anxiously fixed on Sacramento, awaiting the result of the great experiment. For, though the Livermore brothers—Horatio P. and Charles G.—have made it their life work, and, with Albert Gallatin, practically staked all their large financial resources on the result; though the State of California had, with confidence, prison labor used in completing the great dam for the prison site and a power right; though the General Electric Company had, within the past year, undertaken to successfully deliver the power without material loss in Sacramento City, it was, even by the experts, declared to be a doubtful issue.

Sacramento invited the State and the world tc celebrate with her last night, in fitting manner, the solution of the great problem, and the triumph of the men who have overcome all obstacle in attaining tbe result. At the suggestion of the *Bee*, the form of celebration has been as striking and unique as it was appropriate. It took the form of an Electric Carnival, a magnificent spectacular illumination and display, the first of its kind in the world and which to-day no city can duplicate, though in time doubtless the few places in the world possessing similar natural advantages and with the benefit of Sacramento's pioneering, may do so. Twenty-two miles away the immense water-wheels, fed through pipes eight feet in diameter, with the water of tbe American, ceaselessly turned, producing the electric energy for the great spectacle. Here in Sacramento, from nightfall to midnight, over 60,000 people marveled at tbe wonders wrought for them by the Carnival Executive Committee and tbe Director-General.

Twenty-five thousand incandescent lamps, in the cherry, red, apple green and orange tints of the carnival, made the streets and upper air ablaze with light. They were arranged as Maypole streamers on the 150-foot flag pole at the plaza. They blazed forth salutation and congratulation in immense letters from points of vantage along the lines of march of the carnival procession; they were grouped and wrought on residences and places of business into every form suggested by the fancy of the private illuminator; they showed from behind and above and below the carnival bunting that clothed the buildings; they illuminated and glorified the beautiful floats in the procession, being fed from a continuous trolley wire above the moving pageant; they outlined the cornices, the roof, and every column, balcony and rib of the great dome of the Capitol building up to the bird cage at the top, where a mass of arc lights of 24,000 candle power blazoned to the watching villages and towns for fifty miles away in the valley and one hundred in the foothills that the new Sacramento was leading the procession of progress; tbey glittered in thousands in the huge firs and pines of Capitol park, until the beholder might have believed himself in fairyland attending a review of the Christmas trees of the giants.

Allowing for the natural exuberance of the newspaper reporter, the facts come very close to the above statement.

On the same subject, the *Record-Union* of the 11th says:

The great distributing switchboard for the sub-station has not yet arrived from the East, and without which but very limited distribution can take place outside the needs of the company for its car-lines. It appears that not only have the works, incomplete as they are, met the expectations of the engineers and owners, but have exceeded it, and that the company is surprised at the results in saving and in operation. For instance, the 10 per cent loss in transmission has fallen off to but 8½, and the machinery at Folsom has stood the tests of loading very much in excess of that anticipated.

Sufficient has been shown to exemplify ultimate success; and the fact means much to the capital city and the State.

Mineral Output of '94.

A chart is received from the Department of the Interior, prepared by David T. Day, chief of the division of mineral resources, showing in tabulated form the mineral production of the United States for the ten years from 1885 to 1894 inclusive. The figures are interesting, whether by isolated years or in comparison. The value of the total output in '92 was $648,616,954. The value in '94 was $527,655,562. Nothing could be more eloquent than these two aggregates, showing a decrease in two years of $120,961,392, this, too, in the face of the fact that the gold output of '94 was $6,500,000 more than in '92. the figures for '94 and '92 being $39,500,000 and $33,000,000 respectively. The total value of the metallic products mined in this country in '92 was $307,716,239; iu '94, $218,168,788, a decrease of $89,547,451.

In detail, the figures are particularly illustrative of changing conditions. In 1885, 4,044,523 long tons of pig iron were produced, worth at Philadelphia $64,712,400; in '94, 6,657,388 tons were produced—more thau fifty per cent in excess of the '85 product, but worth only $65,007,247 at Philadelphia. The 39,910,279 troy ounces of silver mined in '85 are reckoned in the government tables at $1.2929 per ounce "coining value," and the 49,501,122 ounces produced in '94 are given a fictitious value of $64,000,000 in the aggregate of $218,168,788 quoted above. At sixty-six cents an ounce, the value of the 49,501,122 ounces yield of '94 would be $32,670,740, instead of $64,000,000, the value assigned in the governmeut report before us. The gold yield of '85 is set down at 1,538,376 troy ounces, worth $31,800,000; in '94, 1,910,816 ounces, worth $39,500,000, the yellow metal being the only one on the list that is the same "yesterday, to-day and forever."

The enormous advance in the production of copper, and, indirectly, the universal extension of electric power which is exemplified in such production, is illustrated by comparison of the 170,962,607 pounds mined in '85, worth in New York City $18,292,999, with the 360,844,218 pounds mined last year, worth $33,141,142. The increase of over 100 per cent in copper production in the ten years is in marked contrast to the small increase in lead, a by-product of many silver mines, and the low price, the figures being, in '85, 129,412 short tons, worth $10,469,431, and, in '94, 159,331 tons, worth but $9,942,254.

Quicksilver exhibits the least fluctuations of any metal in the list, the '85 yield being given at 32,073 flasks, worth $979,189 at San Francisco, and the '94 yield 30,416 flasks, worth $934,000. In sharp contrast is the next metal quoted on the list—aluminum—283 pounds in '85, worth $2550—nine dollars a pound—550,000 pounds in '94, worth $316,250—fifty-seven cents per pound. The strangest quotation in the lot is 250 troy ounces platinum, the production of '85, valued here at $187, and 100 ounces in '94, valued at $600.

Probably nothing more clearly exemplifies the increase in the purchasing power of gold than the cold figures arrayed in the long columns of impartial government figures in this report, where the nonmetallic products are aggregated. In '85 there were mined of coal, bituminous and anthracite, long and short tons, a total of 106,850,096 tons; the spot value (that is the value at the place where produced) was $159,019,596. In '94 there were similarly mined 165,178,549 tons, similarly worth $186,141,564. In '85 were produced 7,083,653 barrels salt, worth $4,825,345. In '94 the salt yield is set down at 12,967,417 barrels, but the aggregate value is only $4,739,285.

The chart is remarkably full, and presumably accurate, and of considerable value for purposes of reference and compilation.

Concentrates.

THE Comstock payroll for August amounted to $68,976.16.

THE shaft of the Gwin mine, Calaveras Co., is now just 1000 feet deep.

WORK was resumed this week in the Utica & Stickels mine at Angels Camp.

THE receipts of gold at the Denver mint during August amounted to $335,144.77.

THE Denver papers suggest the organization of a Colorado State miners' association.

THE *Recorder* says the Idaho Gold Reduction Company of Gibbonsville has collapsed.

THE Shasta *Courier* thinks there is a mountain of magnesite on Pit river near Hat creek.

THE Osborn Hill mine has not closed down. The mill will begin crushing ore next Monday.

H. S. SHERARD has bonded the Yolande mine, Inyo county, and proposes to use the cynuide process.

THE ten-stamp mill of the Trinity Consolidated Mining Company, at Dog Creek, started up again this week.

THE Laramie River Mining and Milling Company, capital stock $150,000, has incorporated at Laramie, Wyoming.

THE Helena, Montana, American National Bank received in one shipment last week 217 ounces of coarse placer gold.

THE payroll of the Hora Silver Mining Company, Utah, for the August services of the employes amounts to $20,000.

DIRECTOR PRESTON of the Mint expresses the opinion that California's gold production for 1895 will exceed $15,000,000.

THE Bess Tweed group of mines, near Pony, Montana, has been sold to Chicago men for a price said to be over $500,000.

THE Coe mine near Grass Valley is reported bonded to a New York company, who agree to commence work by October 4th.

THE New Idrin quicksilver mine, which now has fifty men employed, will put in a new sixty-ton furnace in a few months.

THE *Mail* says Cripple Creek's output is now estimated by the most conservative men at between $800,000 and $1,000,000 a month.

THE Marysville & Yuba River Gravel Mining Co. have ceased operations for the season, save to remove the material from the river bed.

THE Simmilakimeen Falls Mining Company has incorporated at Spokane, Wash.; $500,000 capital; incorporators—C. Reeder, H. Shaw and W. C. Ufford.

THE *Review* says that the contract for building the Trail Landing, B. C., smelter has been let to H. Y. Anderson and Peter Costello, of Spokane, Wash.

THE fire in the mines of the United Verde (Arizona) Co. is reported under complete control. It has not interfered with the output or regular working of the property.

THE superintendent of the Santa Rosa mine, Perris, Cal., will add ten more stamps and a new boiler to run the hoist and pumps. The boiler will be arranged to burn oil.

THE holders of 150,000 shares of the stock of the Mercur Gold Mining Company have refused another offer of $750,000 for it. It is thought a better one will shortly be made.

ZACATECAS (Mexico) miners have bought the mill and machinery of the Old Guard mine at Tombstone, Arizona, and it is now being taken down and hauled to Fairbank for shipment.

THE several county miners' associations are electing delegates to the annual convention of the California State Miners' Association, which meets in this city on the 14th of next month.

SUPT. WHITE, of the Edna mine, San Andreas, Cal., has conferred with the Oakland directors, who authorize the erection of steam hoisting works. The shaft is now in gold-bearing quartz.

A SOUTH DAKOTA mining paper reports a superintendent as saying: "I can get $30,000 for putting a plant at the mine, when at the same time the company refuses me $500 to open up the mine."

THE Bank of England has raised its price for American eagles to 76s 3¾d per ounce, which was not done to attract gold, but because the lower price resulted in a profit on melting the coin into bars.

HUERFANO COUNTY, COL., is attracting some attention on account of the announcement of recent discoveries of tin ore that contains a greater percentage of tin than any yet discovered in this country.

THE Grizzly Flat Gold Mining Company has incorporated; capital stock $1,000,000—$50 subscribed; incorporators—L. Gibson, C. H. Lindley, C. E. Elliott, S. C. Irving and C. G. E. Mainwart, of San Francisco.

THE Alluvial Mining Company has incorporated at San Jose, Cal., with $120,000 capital stock; $70,000 subscribed; to work hydraulic mines recently located by Jas. Farthing near Colon, S. A.; said to be extraordinarily rich.

THE gold yield for Victoria for the quarter ending the 30th of June was 166,709 oz., being an increase of 15,854 oz. over the yield during the first quarter of 1895 and a decrease of 10,729 oz. as compared with similar quarter June quarter of 1894.

NEARLY 200 feet below the surface of the earth in the zinc mines of western Missouri miners have recently come in contact with logs of very fine grain and texture. On top of them were 100 feet of lead and zinc ores and 65 feet of solid flint rock.

A SALEM, Or., man, in receipt of a half-dollar of the government vintage of '94, has written to the U. S. District Attorney at Portland, averring his belief that it is a counterfeit and asking for an immediate investigation. This is hard on Uncle Sam.

A FIRE at the Whitlock mine, Mariposa Co., last Sunday night destroyed the hoisting works and 100 feet of the timbered walls at the entrance of the shaft before it was got under control. The fire started from a lighted candle, near the mouth of the shaft.

THE Golden Sand Placer Mining Company has incorporated; capital stock of $1,000,000, $500 subscribed. The incorporators are J. Reagan, E. Damon, S. T. Hubbell and Charles H. Jackson, of San Francisco; and George B. Tolman of Alameda; to mine in Amador county.

THE Calaveras *Citizen* says the company who have the Scieffard mine under bond have decided to purchase at the end of the three months, that is $25,000 cash is to be paid over by November 1st. The company is composed of Boston capitalists, and evidently mean business. Work on the property will commence about October 1st.

THE Phœnix Mining and Milling Co. has been incorporated at Ellensburg, Wash., by D. Shoudy, J. A. Shoudy, Jr., and E. A. Grundy; capital stock, $150,000. The incorporators have holdings in the Peshastin district and will establish extensive works to develop the property.

A BOND of the Austerlitz Gold Mining Company to the National Mining and Development Co., consideration $80,000; and bond from Albert Sheltenbrand for the Sheltenbrand group of mines, consideration $60,000, has been filed at Tucson, Arizona. All are located in the Oro Blanco district.

SAYS the Jackson (Cal.) *Dispatch:* Wm. Doyle has sold and bonded the Doyle mine, and work upon it has begun in Hunt's Gulch. Twenty-five thousand dollars is to be paid in nine months or $35,000 will be paid for the mine in two years from this sale and contract for said mine and $75 per month to Doyle.

REGARDING recent statements of alleged proffers or negotiations looking to the sale of the property of the Golden Cross Mining and Milling Co., at Hedges, Cal., it is in order to state authoritatively that the property is not on the market, has not been offered for sale, and no bona fide offer has been made.

P. J. SHIELDS, W. D. McCurdie, George A. Cameron, J. Mullen, S. McFarlane and A. A. Collins have incorporated as the United States Mining Company, for the purpose of operating properties in Wicks, Lump gulch and Gregory, Montana, and say they will put $150,000 into development work; capital stock, $500,000.

THE Old Dominion Copper Company, of Globe, Arizona, has entered into a contract with the Gila Valley, Globe & Northern Railroad for the delivery of coke and transportation of copper, and has received assurances that construction of the railroad will be resumed and the road completed into Globe by January 1, 1896.

THE statement of the mineral products of the United States for ten years, just issued by Hon. David T. Day, chief of division of mineral resources, Department of the Interior, shows that the total value of metallic products in 1885 was $181,586,587, that it rose to $307,716,239 in 1892, and declined to $218,168,788 in 1894.

THE South Dakota State School of Mines has gone into the assaying business, and advertises its charges in competition with those who make their living in a branch of the mining business that at the best is poorly paid and subject to enough competition now without having to compete with an institution supported by the State.

THE Franco-American Mining Co., recently organized at Tucson, has bought the Gen. Dietzler group of mines in the Oro Blanco district, Pima Co., Arizona, consisting of the Franco-American, Lonise and Norma mines. Local papers credit the company with an intention to expend between $25,000 and $30,000 in development work before building reduction works.

A WALLACE, IDAHO, dispatch says the Poorman mine at Burke, on Canyon creek, has closed down. One hundred and fifteen men are thus out of employment. The management states that the mine will cease operations for an indefinite period. The low prices of silver and lead and the increased cost of working the property during the winter months are said to be the reasons.

THE Columbia Channel Gold Mining Company has filed articles of incorporation in this city; capital stock $10,000,000. Incorporators—J. M. Harper, J. P. Martin, J. M. Allen, W. E. Sharon and H. McAllister. It is the purpose to work mining property in Plumas county and consolidate under one working management the Columbia, Merced, Sacramento, San Joaquin, Stanislaus, Gallant and Yuba mines in Sierra county.

THE Leon Gold Mining Company has incorporated in Los Angeles; capital stock is $100,000; $75,000 actually subscribed as follows, the subscribers being directors for the first year: C. H. Briggs, $25,000; J. W. Briggs, $25,000; W. H. Bailey, $6249; C. A. Bailey, $6250; W. H. Bailey, Jr., $1; S. R. Porter, $6250; G. W. Parsons, $6250. The company is the owner of the Briggs mine, fourteen miles southeast of Perris, Riverside Co.

IF half what is reported from the Ranchita mine, in Julian district, San Diego Co., be true, there will be a "boom" in that vicinity. Two men are said to have got out $2000 in less than a week. There are a good many good prospects there, and the country shares with other parts of the State the distinction of being the ideal gold mining region in ease of access, beauty of climate, abundance of wood and water and good roads.

THE following statement of the Tacoma Smelting and Refining Co., for the month of August, 1895, is furnished by the secretary of the Tacoma Chamber of Commerce: 2800 bars bullion, weighing 286,741 lbs., containing: 1,660.01 ozs. gold at $20.67, $34,312.41; 28,510.83 ozs. silver at 66¾c, $19,030.98; 282,404 lbs. lead at 3⅓c, $9,598.64; total, $62,942,03. Number of men employed, 60; payroll, $5,039.56; wood choppers and teams, $828; total, $5,867.56.

A COMBINATION of New York, New Jersey and St. Louis capitalists is reported formed to control the appointment of commissioners to succeed W. S. Davis, in the selection of lands on the Uintah and Uncompahgre reservations in Utah. By this appointment the combination hope to get possession of the Gilsonite (asphaltum) deposits there. The material is so valuable that it pays to haul it one hundred miles by team and across the continent by rail.

THE Granite Mountain Company and Fisher brothers, of Montana, have closed a deal by which the Granite Company becomes owner of the Bullion mine, located about 16 miles from Basin, Montana. The price is understood to be $75,000. A 900-foot tunnel has been run on the Bullion along the vein, which is said to be 10 to 12 feet wide and averages $10 a ton. The company has had the purchase of this property under consideration for some time, and several experts have examined and reported upon it.

W. HAMILTON SMITH is now in Cripple Creek, Colorado. The local reporter quotes him as saying of the British investors: "They are timid regarding all American mines. They have been robbed so often by mining sharks that they almost regard American mining men as being devoid of honesty, and are afraid to venture their money on the best showing. They think of nothing but South Africa, and any kind of stock certificate bearing a South African seal can be sold whether the company has any property or not."

FOR some little time past, says the London *Mining World*, rumors have been current to the effect that California was about to imitate South Africa and West Australia by having a mining boom herself. The fact that California is one of the richest gold-producing countries in the world—if not the richest—is such common knowledge that it needs no demonstration. She headed the list again last year in the quantity of the precious metal which 1894 added to the world's store, and it would have been remarkable indeed had such a country escaped the eye of capitalists in search of properties to meet the constantly growing demand that exists for gold mines of proved value.

THE copper lodes in New South Wales were first opened in 1858, since which time many thousand tons of copper ore have been obtained. The London *Mining Journal* says the copper-producing country covers an area equal to about 4,296,320 acres; but there are enormous tracts of country, the exploration of which will increase the area. The most important copper mine in the colony at the present time is the Great Cobar mine, and it also is the most distant from the seaboard, being 497 miles west of Sydney. The value of the copper raised in the colony and exported to the end of 1894 was £6,343,044.

THE owners of the Sunshine group of mines, Camp Floyd district, Utah, last Saturday signed a contract with the Gold and Silver Extraction Co. of America, limited, in the sum of $100,000, the contract to be void should the courts declare the patent invalid. The application of cyanide of potassium to the treatment of its product will be made to the ores of the Sunshine upon the completion of its mill and the turning on of water by the Gold Belt Water Power Company. The daily capacity of this mill is 150 tons a day, to be increased to 300 tons. The productive capacity of the mine, it is claimed, is from 450 to 500 tons a day, with ore in sight to maintain a production at this figure for five years.

THE big strike of the iron ore miners at Ishpeming and Negaunee, Michigan, is still on. The new company scale which the men refuse is as follows: Contract miners' average, $1.70 per day; company account miners, $1.60; underground laborers, $1.40; underground trammers, $1.40; pumpmen, $1.75; foremen of timbermen, $1.90; ordinary timbermen, $1.40; track foremen, $1.60; electric haulage motormen, $2.10; engineers, 12 hours, $1.70; firemen, 12 hours, $1.60; blacksmiths, $1.65 to $2.40; carpenters, $1.70; machinists, $1.90 to $2.25; foremen timber cutters, $1.50; ordinary timber cutters, classed as ordinary laborers, $1.25; teamsters, $1.40; ore inspectors, $1.25; surface laborers, $1.25; surface trammers, $1.30; engineers steam shovels, $2.65; cranesmen steam shovels, $2.20; firemen steam shovels, $1.55; diamond drill runners, $1.75; diamond drill helpers, $1.55.

SOME time ago the Marysville *Democrat* suggested that the California Miners' Association and the Anti-Debris Association should both disband, and gave its reasons for its belief. Since then the attorney for the Anti-Debris Association and other paid retainers of that body have kept up a bitter personal attack upon the *Democrat* and its editor because of his suggestion that that association should cease bestowing sustenance upon them. It was all right for the *Democrat* to suggest that the miners forsake their organization, but most dreadful to make similar suggestion regarding the anti-debris men. Mr. Devlin is apparently dissatisfied with the vigorous and impartial methods of the Debris Commission, which render his official existence unnecessary, and is doing his little worst or best to keep alive factional bitterness. The perpetuity of his job seems, in his opinion, to depend upon his ability to keep alive suicidal sectional strife.

REGARDING the bounty bill recently passed by the Dominion Parliament for smelter ore, it is to be said that there are no smelters in any part of Canada except British Columbia. There are quartz mills, which are inexpensive as compared with smelters. A well equipped smelter will cost above $200,000, and before a smelter can be started in British Columbia the cost of establishing it and the capital required to purchase ores will run from a quarter to half a million dollars. In connection with silver-lead smelting, it is believed that the men most closely connected with the mining industry in Kootenay would prefer to see the duty on lead increased to the same figure as in the United States rather than have the bounty. For this reason, although the United States produces more lead than any other country in the world, it purchases largely from Mexico in this way: The silver-lead bullion is shipped from Mexico to the United States in bond. It is there refined, and the lead, instead of being entered for home consumption, is shipped in bond to Canada and Great Britain. Hence the great proportion of lead used in Canada comes from Mexico, where the miners' wages average eighty cents a day, whereas in British Columbia miners are paid $3 per day, so that the British Columbia miner is brought in competition with the eighty-cent per day labor of Mexico. Therefore they would rather see the duty on lead increased to the same level as in the United States; but the government preferring the bounty system, as is paid to the iron industry and adopted by the Ontario government, have adopted that measure.

A LONDON cablegram says: The financial madness which began to spread among the English public last spring reached what is probably its culminating stage last week. Never during the present generation has there been such an amazing display of insane folly and recklessness in speculation as is now being witnessed. The South Africa and West Australia mining craze has grown until hundreds of millions of dollars have been poured into all manner of enterprises by the general public. Most of the schemes are advanced by Barney Barnato, whose fame is now world-wide. He has been so successful that his name is sufficient to draw millions from the pockets of the gain-thirsting public without other guarantee. The sum which this man has been able to draw into the treasuries of his enterprises, in the form of popular subscriptions, has now amounted to the amazing total of $150,000,000. His last coup is the most astonishing, possibly, in financial history. He put on the market last Monday the stock of the Barnato Banking, Mining and Estate Corporation, Limited. No prospectus was issued nor any statement of constitution, objects or management of the institution. One or two preliminary deals were made with syndicates whose members cleared more than $10,000,000 in a single day by unloading on the public. Demands for shares of this bank, when offered for sale on the Stock Exchange on Monday, seemed limitless. Five-dollar shares sold in immense quantities before business closed at $22. This is equivalent to a capitalization of $75,000,000 of an undefined financial institution, which has hardly begun business. Men of finance, who are not infected by this strange madness, are wondering how soon the crash will come.

Some Calaveras Mines.

By Our Traveling Correspondent.

In a previous article I have described the mines of Angels, and while the mines of that place, by reason of their bullion output, excel at this time those of other sections, yet all the mines of Calaveras county are not at Angels. Southwest of Murphys, Captain Merry has taken hold of the Carley mine and with hoist and mill will soon have it producing. This mine is one of the first quartz mines worked in this section; in the early days it was known as the Sperry mine and afterward as the Webelhuth mine. For many long years Webelhuth worked hard and faithfully trying to make the vein course where he would have it, refusing to drift on the vein when crosscut because its strike was not what he had determined it must be and, finally, in despair, committing suicide, bequeathing the mine to Mr. S. Carley, who had but to drift on the vein to get into bonanza. The main ridge runs about east and west, and from this a spur puts off north until nearing a ridge running east and west, when it turns and swings northwest. The vein followed along the side of the main ridge until it encountered the spur, when it followed the same north to the turn and then swung west with the ridge. As the point of discovery was on this west swing, a determined effort was made to crosscut it on the same strike east. But veins, like gold, are where you find them, and drifts run on the vein now show that it followed the snake-like course of the ridge. The mines in the limestone at Murphys are idle. About a million dollars was wasted there in scratching over the surface of the solid limestone, when a few thousand dollars expended in the development of the contact vein, following the limestone for miles through this section, might have shown up a mineral belt of great value and extent.

On Indian creek the Right Bower, that was very rich in days gone by, waits for some one to take it up. The old shaft can be tapped by a tunnel, the surface water drained and the vein developed. The Calaveras, on the same vein to the east, was still richer. It is claimed by the miners that the last work done was not on the vein and, if it was, the pitch of the shoot is such that the drift run did not extend to it. As old mines with a past bullion record are now in demand, these two are worthy of an inspection. To the north is Sheep Ranch, where the Sheep Ranch mine gave up about $4,000,000 and was then hung up at a depth of 1400 feet. This mine had a shoot 1900 feet long on the surface. In depth the walls came together at one end and gradually narrowed the shoot down to 1200 feet, when it again expanded and was almost back to its old length when work was stopped. With a good hoist and skips instead of the old bucket, and sufficient power, the Sheep Ranch mine could now be made to yield larger dividends than in the past. Near Sheep Ranch H. Cleary & Martin are opening up the Table Mountain gravel mine; their shaft is down forty feet to bedrock, where they claim to have six to nine feet of gravel that gives $3 to the car. They have a good hoist and four-stamp mill in operation.

At El Dorado the mines of the Rodaseni estate are all idle. Among these mines there are some good properties.

Just north of El Dorado the Banner blue gravel mine has just been bonded to Mr. J. A. Rigby and others, who are arranging to put up a good hoist and mill. The bedrock is sixty feet deep there, with fifteen feet of gravel in a channel 120 feet wide and 8000 feet on the stream, the gravel averaging $2.50 a ton at the shaft, with richer gravel above and below them. They seem to have a good proposition.

Railroad Flat is "flat" at this time, with brighter prospects. Mr. W. H. Clary has secured the old Pettycoat mine and will reopen it. The Pettycoat is the mother lode of the camp, the other veins being feeders. In the past the mine milled as high as $100 to the ton from its three-foot vein. Miners claim that the drifts were run in the opposite direction of the shoot, while old Trainor states that the drifts were purposely driven along, but not into, the vein. Be that as it may, the mine is now in the hands of people who will give it a thorough prospecting. Near the Pettycoat is the Keystone—Ellsworth & Co., owners. This is a nice little mine, with a twelve-inch vein in slate that mills an average of $30 a ton from a 200-foot shoot. The old Ham mine, about four miles east of Railroad Flat, is being reopened by tunnel by Ham & Pillsbury. The mine was worked in 1875 and then gave $22 a ton. The Kangaroo, the property of A. Trainor, is the extension north of the Pettycoat. Mr. Trainor is putting down a new shaft and taking out $6 to $8 ore. West, towards Glencoe, the Poorman is being reopened, with C. L. Morrill in charge. The company is showing its faith in the old mine by erecting heavy machinery before beginning work. In the past this mine gave 1900 tons of ore that milled $261 a ton, while selected ore gave $700 to $900 a ton, and the lowest milling value was $81. A plat of the old works, if correct, shows that when the levels were extended to a point perpendicularly below where the ore shoot was struck in the upper level and no ore encountered, the drift was stopped and the mine shut down. Apparently the drift would have caught the shoot had it been extended but a few feet to allow for the pitch of the shoot. The vein is in porphyry. Crossing the river we next strike West Point. This town is one of those camps that "when they're down, they're down," and "when they're up, they're way up." After a long trip on the "down" grade the town is now going "up." At the Lockwood, Calbick & Fuller have put the shaft down sixty feet and are going into an old-time bonanza with a twelve-inch streak of $70 ore on the hanging wall and twelve inches of $171.46 quartz on the footwall. They will now drift out into the ore body and test its wealth. In the past the Lockwood's bonanzas were about eight feet in width, and went from $80 up. The present owners feel very jubilant over their strike, and all West Point is with them. The Blazing Star, W. E. Foster, proprietor, is now down 400 feet, with lower drift run 165 feet on the two-foot vein. The $25 to $50 ore is milled on the mine and all over that is shipped to Selby & Co., and goes from $150 to $185 a ton.

From West Point we drive past Glencoe to Rich Gulch. Mr. W. T. Harris, of the Roanoak, has taken a bond on the old Foot & Thompson mine, and expects to pound out a profit from its low-grade ores, assisted by the occasional pockets. Col. W. T. Robinson is erecting a twenty-stamp mill on the Esperanza, more commonly called the Boston. The mine is developed both by shafts and drifts and shows a very large body of milling ore. The Colonel claims that once he gets the mine fully equipped and developed it will be second to none in the State.

The Gwin, F. F. Thomas superintendent.—The Gwin is perhaps as well known as any of the old mines in the county. Fortunately it has fallen into good hands, and in consequence will in time excel its past production of $3,000,000. Associated with Mr. Thomas are a number of the Kennedy mine owners, the officers being M. W. Belshaw, president; E. C. Voorheis, vice-president; M. W. Belshaw, E. C. Voorheis, D. McClure Jr., F. F. Thomas, E. P. Ellis, directors. The old north shaft was put down 400 feet and the south 1540. For want of a pump of sufficient capacity the work was transferred from the lower to the levels above. The ore bodies in these levels were sufficient to keep the mine running for years, and when the mine shut down the ore in the lower levels was intact. According to the old foreman, J. Oueta, the vein was there about eight feet wide, with quartz milling $8 a ton, and a level run 1040 feet in good ore. This was the north shaft. Mr. Thomas has in operation a hoist calculated to go 4500 feet deep and carry four tons to the load at a rate of 700 feet to the minute. The shaft is 390 feet east of the vein and 225 feet north of the old north shaft. At this time the shaft is down 876 feet, with contract let for 300 additional feet. At 700 feet a crosscut has been run west 300 feet. Mr. Thomas expects to cut the vein at about 365 feet. In driving the crosscut a fissure filled with gangue has been crosscut. This may prove to be the Gwin vein fissure, as the old foreman states that there was no quartz in the fissure in the old drifts until a point lower was reached. Mr. T. is coming to the conclusion that the quartz may not come up that far, and will not crosscut again until the 1000-foot level is reached. This is the Amador county way of operating a mine. Once the other locations on the mother lode in this county are taken hold of by operators who are willing to go 1000 feet to find pay ore Calaveras will have a good number of Uticas.

The Gwin is operated by water power under 365-foot head. Of course there is no mill on the mine, nor will there be until the owners have the ore in sight to feed it.

South of Mokelumne Hill, Mr. W. T. Harris is operating the Roanoak. The mine is opened by a tunnel 400 feet long and a shaft 160 feet on the vein. The vein is about five feet wide and mills $4 to $15 a ton. The tunnel was driven to tap the old gravel channel and the vein crosscut under the channel, upsetting the old theory that "no lava-covered channel was ever known to have a vein running and cropping in the channel." The Roanoak has recently acquired the old Samphear mine to the south, on the same vein, and will proceed to develop and operate it.

At Donnollans De Goyla & Co. are putting the Donnollan mine into shape and have their ditch about completed. The Donnollan is, on the surface, a wide body of ore that shows a large amount of visible gold in places.

Near San Andreas De Goyla & Co. are opening up the Gottschalk and the extension to the west, both on the mother lode.

East of San Andreas the Thorpe mine, in charge of L. Alleghwar, is putting in a large pump The Thorpe has the reputation of being a good mine and of being able to supply its own water—in fact the supply has not only exceeded the demand but the pumping capacity of the plant. With the new pump Mr. A. expects to see an end to this trouble and get his shaft down 300 feet below the present 250 feet of depth, when he expects to be in good ore. With the exception of about three mines, there is a stretch twenty-five miles long, from Angels to Amador, in Calaveras, on the mother lode, that awaits the coming of capital to develop, equip and place its bullion in circulation. Taking the county as a whole, it will be seen that there is at this time double the number of mines in operation that there was a year ago; that the work is in the hands of experienced operators who are able to carry it through to a successful termination, and that, in almost every mine, the showing is good. Mokelumne Hill and San Andreas, in the hands of the present practical miners, will soon put that portion of the county's mining area in the column with Angels' big producers.

E. H. SCHAEFFLE.

Murphys, Cal., Aug. 29, 1895.

Critical Periods in the History of the Earth.*

NUMBER III.

By JOSEPH LE CONTE, of the University of California.

Effect of New Dominant Types.—New dominant types, as already shown, are always an important factor, increasing, continuing and completing the changes commenced by other factors of evolution. This is well illustrated by the rapid disappearance of the great Mesozoic reptiles on the appearance of the Tertiary mammals, and of the great Palæozoic ganoids on the appearance of the Mesozoic reptiles. But in the case of the appearance of man, this effect was far greater than in any other. The changes of life-forms produced during the glacial period in the manner already explained have been continued and increased by man. The whole fauna and flora of the earth are now being changed by his agency and readjusted to his wants, and the change will be completed only when the whole earth is occupied by civilized man. Evidently, then, there is now going on under our eyes and by human agency, a change in organic forms, more complete and more rapid than has ever before taken place in the whole history of the earth. Shall we ignore it because we are in the midst of it, or because we are ourselves the main agent in bringing it about? Must not man be accounted among the agencies of nature?

4. Among the characteristics of critical periods we mentioned also the birth of great mountain ranges. Have we any such born at this time? I think we have.

On account, I suppose, of the increasing rigidity of the earth's crust, the great movements of this time were mainly epeirogenic not orogenic. Mountains of the usual type, *i. e.*, by strata-crushing, were not formed unless we make an exception in case of plications of Pliocene strata in the coast ranges of California, mentioned by Lawson. But on the western margin of the American continent, mountains of the monoclinal type, *i. e.*, by block-tilting, were formed on a grand scale. Examples of these are found in the basin ranges, in the Sierra Nevada and Wahsatch (which border the basin on either side), and in Alaska, as shown by Russell, in Mount St. Elias range. All these mountains had been already formed at a previous time as mountains of the usual type, but at the end of the Tertiary or beginning of the Quaternary, they were rejuvenated and their present forms and heights given as mountains of the monoclinal type.

It is almost impossible to overstate the greatness of the changes which took place during this wonderful period. Besides the elevation of the American continent from 3000 to 5000 feet, and its extension to the border of the now submerged continental margin, and the formation of mountain ranges of monoclinal type; besides the broad connection with Asia by the Behring region, and with South America by the Antillean region; besides the enormous climatic changes and its resulting ice sheet, we must add also great extensions of lakes so as to form inland fresh-water seas in the Canadian lake region and in the basin region. We must add also the greatly increased elevation of the plateau region and the cutting of the inner gorge of the grand canyon, and the cutting of all the grand gorges which trench the flanks of the Sierra Nevada.

Equally great epeirogenic movements are known to have occurred in Europe, Africa and South America, but it would carry us too far to dwell on these.

Psychozoic Era.—I repeat, then, that the present must be regarded as a primary division of time, *i. e.*, an Era. If so, it deserves a distinctive name as such. I have called it the Psychozoic Era. If any one can suggest a better name I shall willingly adopt it.

I have the Quaternary or glacial period as a transition or critical period between two great eras, the Cenozoic and Psychozoic. To which of these it ought to be united is a question of less importance. Critical periods are usually largely lost intervals. This one, partly because the oscillations were perhaps not so great, but mainly because it is so recent, has been recovered. The lost records of other critical periods have also been partly recovered, and more will be recovered hereafter. In these former critical periods the recovered record has usually been united with the previous era. The new era commences only when the new forms are well established. Thus the Permian is united with the Palæozoic and the Laramie with the Cretaceous. Therefore, it is proper

* Bulletin No. 11, of the Department of Geology.

that the Quaternary or glacial period should be united with the Cenozoic. But, unfortunately, it has been usually supposed that this carries with it also the Present as a mere epoch of the Quaternary. Because the record of this interval has been entirely recovered; because the change in this case is seen to be gradual instead of apparently sudden, as is often the case in other critical periods; and finally because it is not yet completed but still going on under our eyes, most geologists do not recognize the greatness of the change. If it were farther away, already completed, and the records of the gradual process lost, it would be recognized at once. As the great mass of a mountain range cannot be seen when we are among its peaks, so being in the midst of this great change, and seeing it so close at hand, we fail to catch the true perspective and recognize its greatness.

If, then, the Psychozoic be acknowledged as an Era, the Quaternary ought to be united with the Cenozoic rather than the Psychozoic. It is true it may be objected, as has been done by Upham, that man appeared in the Quaternary. The answer to this is, that he had not yet established his supremacy, but still contended doubtfully with the great mammals of that time. This is in full accord with the cases of other eras. Reptiles appeared first in the Permian, but the age of reptiles commenced only with the Mesozoic. Mammals were introduced first in the Mesozoic, but the age of mammals commenced only with the Cenozoic. So man was introduced in the Quaternary and possibly even in the Tertiary, but the Age of Man commences only with the Psychozoic. The changes must not only commence but be substantially completed and a new order of adjustment established before a new era begins.

This critical period, as the last, the nearest to us, and therefore the clearest, may be taken as the type. The attentive study of this one ought to throw abundant light on the true nature of critical periods in general. It is, however, the shortest in lapse of time. It is, also, probably the least so far as changes of life-forms produced by physical changes are concerned. But it is by far the greatest of all so far as concerns the effect of its dominant type in determining changes of all kinds.

We have taken this one as the type and dwelt upon it, because its significance is not generally recognized. The other examples are well known and their importance recognized. They may be easily explained in the light of this one and therefore may be quickly dispatched, especially if I have already treated them fully in the article previously referred to.

(To be continued.)

Why Are Good Mines For Sale?

The answer may be found in a simple statement of fact. In a great many instances the owners are men whose lives have been spent in poverty and a daily struggle for existence. They know they have a fortune; they have had enough of battle and strife. They want to enjoy life. They have dreamed of a "good time," and they want to realize their dreams. The man, no matter whether young or old, who never before had a dollar, who suddenly finds himself the owner of property worth many thousands, has an uncontrollable desire to see his fortune in shining gold or crisp bank notes. He wants to take life easy. He wants to move out of a miner's cabin into a home provided with the luxuries of life, and he don't want to wait. He has not been wealthy long enough to want more. He feels that he never will want more, but what he has in the way of property he wants to convert at once into cash. It may be added that there are now many prospectors climbing the mountain sides, searching for the precious metals, who have owned great mines, sold them and wasted the money having a good time.—Sierra County, N. M., Advocate.

A GIGANTIC UNDERTAKING, the bridging over of Polk's strait, separating the island of Ceylon from the mainland of India, is seriously proposed by the government of Ceylon. The strait is forty-one miles broad at its narrowest point—double the width of the English channel—but is very shallow, in many places only six feet deep. The islands, reefs and channels in it have been recently surveyed, and the cost of the work, extending over sixty-one miles, including the Pambam channel and the Adam's Bridge reef, is estimated at 28,000,000 rupees. The ends will be connected by 145 miles of railroad with Colombo, the great harbor of Ceylon, on one side, and by ninety miles of road with Madura, the nearest point of the Indian Railroad system, on the other. If narrow gauge is used this can be done for 11,000,000 rupees more.

Three-Phase Long Distance Electrical Transmission for Mining Work.

(Continued from page 165.)

current in the armature winding while gaining speed is contained in the armature itself, and the handle shown in the cut serves to cut out the resistance when the motor is fully up to speed. These induction motors are built to stand the severest conditions met with in actual service and wherever they have been employed have answered every requirement

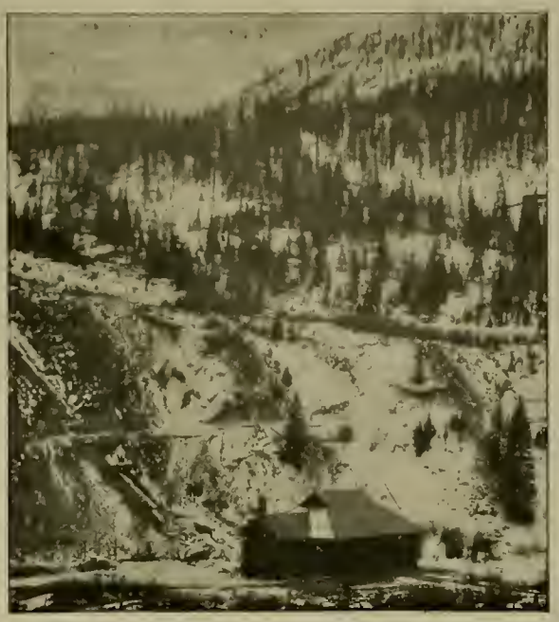


FIG 3.—POWER HOUSE AT END OF FLUME.

possible. The interest in this mine centers, of course, upon the economy induced by the electrical installation. The power used in the mill and the mines at the present time is more than three times as much as was used when generated by the steam engine previously employed. If, therefore, $1000 a month, or $12,000 a year, would be economized by using the same power, an economy of not less than $36,000 a year is effected by the operation of the mine by electricity and a greater power is available. This has allowed of the operation of machinery inside the mine for the first time.

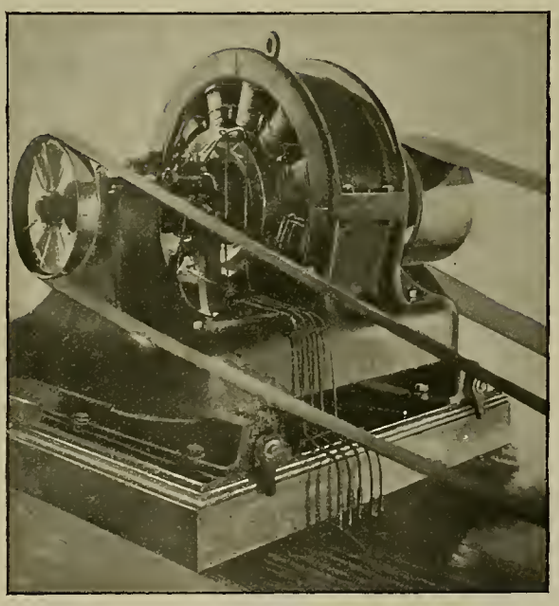


FIG. 4.—THE THREE-PHASE GENERATOR.

Before such figures as these any question as to the economy of an electrical installation, when coal is anywhere near the price it is in this case, becomes irrational.

A Hard Working Prospector.

George Hawlin, of the Relief mine, is in town. He says things are looking away up on his property. On being asked how much work he had done, he said: "Work is a little slow, which of necessity it must be when I have only an 'arm strong' hoist to pull dirt out of a hole 180 feet deep. The fact of the matter is I have done a whole lot of work, which I will tell you all about if you will just wait. You see on the Venus, which is westerly of the Relief, at a point about 1200 feet from the center, there is a shaft twenty feet deep with $20 ore. Three hundred feet from there is a 112-foot shaft of $12 ore. Five hundred feet farther, 20-foot shaft with a streak of $30 rock. Thirty feet from that is the Relief, where there is a 17-foot shaft with $17 ore. Twenty feet north of that is a hole 10 feet deep that has $60 ore in it. One hundred feet east of that is a 40-foot shaft with $7 ore. One hundred feet from that is a 25-foot shaft, $10 ore. Easterly 100 feet, 20-foot shaft, $10 ore. Sixty feet easterly is the 180-foot shaft, which has a 20-inch vein of $16 rock. Farther easterly, on the Relief No. 2, I have three feet of $10 ore on the surface. Now, that is all there is to it, and if you don't believe it just come out and we will prove it. But for God's sake don't say that I have got a bonanza."—Phœnix Herald.

How Sandpaper is Made.

Sandpaper as now made is false to its name, for it has no sand about it, the place of that material being now taken usually by powdered glass, which does its work with greater effect.

First is the pulverization of the glass into different grades of fineness. Commonly, an iron mortar is used; stamping machinery is better. Such a machine consists of a stout box whose iron walls serve as a base for the stamping machinery. In the box are two iron cylinders in which the stamps work. These crush the glass, turning on their own axis as they work.

For grading the crushed glass, several sifting cylinders are necessary, covered with gauze of different mesh. Beginning with the coarsest, the work proceeds gradually to the finest, resifting each time that which passes through the network. The paper to be used in the manufacture must be good, strong and long-fibered, free from knots and irregularities. It is cut into large sheets, spread on work tables, fastened down and painted with a thin, even coat of hot glue. If the glue is too thin and the paper of bad quality, the glue soaks into the paper, so that which remains is not of sufficient consistency to hold the glass. Thus results a sandpaper from which the glass easily rubs off, or which in places has no glass at all or not enough. This is notably the case with the coarser varieties, in which the layer of glue must be put on with exceeding care, that the relatively large fragments of glass, which can in no manner be soaked with the binding material, may be held fast in it. On the other hand, if the layer of glue is too thick, the outer part hardens too quickly, so that the glass powder cannot imbed itself in it.

When the glue has been spread on the paper, the powdered glass must be sifted on through an appropriate sieve. This operation also requires considerable skill, though not so much as the spreading of the glue, for the glass must not be sifted merely in such a manner as to use a given quantity to a sheet, but so that each sheet may be covered evenly. Even then all the powder will not stick, and some of the particles lie upon others without touching the glue. These can be shaken off by a slight movement of the paper. When the superfluous glass powder has been removed a wooden roller is passed lightly over the paper to press the particles of glass as firmly as possible into the glue and to form a perfectly even surface.

The De Lamar, Nevada, Mines.

TO THE EDITOR:—The principal group of mines in this camp is owned by the De Lamar Gold Mining Company, and consists of six locations. The ledge is forty feet wide, the highest grade ore milled running from $50 to $100 per ton in gold; the lowest grade ore in the forty feet will run $12 per ton. This group is worked by tunnels, and employs sixty-five miners and fifty mill and outside hands. The ore is treated by the cyanide process, the capacity of the mill being sixty tons per day. Attached to the mill is an electric plant, saw mill and air compressor which furnishes air for the rock drills. About $30,000 worth of bullion is shipped each week, being carried 150 miles by the company's Concord coach to Millford, Utah, which is the terminus of the railroad. Three thoroughly armed messengers accompany the coach, in case of an attack by road agents.

The April Fool group consists of five claims and is owned by Wilson, Dooley and others. Four carloads of ore have been shipped from this group of mines, the first two carloads netting $300 per ton and the other two $600 per ton. Two more carloads are now being hauled to Milford.

The town of De Lamar is building up very rapidly, there being ahead four large stone buildings, together with 200 other houses and tents. Very little development work has been done on outside properties, although there are several large ledges, the cropping of which will run from $4 to $8. Cord wood is worth $5 per cord, and water one cent per gallon.

MINER.

De Lamar, Lincoln Co., Nevada, Sept. 2, 1895.

ON the basis that there are 1,250,000 freight cars of all kinds and 35,000 locomotives in service in the United States, it will cost $52,000,000 to fit them with safety appliances as provided by act of Congress. All work must be completed by Jan. 1, 1898.

Mining Summary.

CALIFORNIA.

Amador.

AMADOR QUEEN.—*Dispatch:* James Dye is opening up and cleaning out the old shaft and tunnel in the Amador Queen mine below the Doyle mine, and just below and joining the south end of the 60 stamp mill of the Amador Gold Mine Limited, now called the Amador Gold-Fields and has erected a large derrick and hoisting works down in the Gulch, below the mouth of the Amador Queen.

THE ANITA.—*Republican:* Bids for running 300 feet of drifts at the Anita were opened last Saturday. The lowest bid, was for $3.15 per foot. A prior contract was at the rate of $10 per foot, and at that rate the contractors were not able to average more than $3 per day.

Calaveras.

Echo: H. Routledge has received information that the Blazing Star and Lone Star mines at West Point, on which he holds bonds, are sold to a company in London, England, through the agency of Wm. Hibbitt.

El Dorado.

UNUSUAL AT PLACERVILLE. — *Republican:* Some rather curious mining operations were going on at the Unity mine this week, a hydraulic being set in operation almost under the steam engine used for hoisting. During the last two months Superintendent Kimble accumulated about 3,500 carloads of gravel in a dump over 100 feet long, and concluded to wash this through a flume. Pipe was laid and the water turned against the pile of dirt last Thursday with about fifty feet pressure. This is the first time hydraulic power has been used in this county to wash the dirt from the drift gravel mines.

THE UNITY MINE.—*Democrat:* At the Unity mine, formerly the Wild Cat mine, near Gaylors bridge, one of the group of mines owned by the Pine Hill Mining & Land Company, eight men are now employed, under Supt. Hill, excavating and grading a site for the new hoisting plant.

THE LONE STAR.—The Lone Star or Newton mine, with Hutchinson for Superintendent and Theodore Rupley for foreman, is running with a force of twenty-one men. Rich beds of grave 12½ feet deep in the main tunnel, four feet deep on the upper bench and of unknown extent, have been developed.

Los Angeles.

NEW COMPANY.—The Piramide Mining Company has incorporated; capital stock, $2,000,000. Directors—P. L. Griffin, G. R. Weeks, Los Angeles; W. E. Howard, San Diego; L. Hahn, Hastings, Nebraska; B. Morse, Riverside; G. Bratt, Hemet, Cal.; W. S. Oliver, Ensenada, Baja California.

Nevada.

THE TREVASKIS MINE SOLD. — *Transcript:* Geo. B. Treadwell, who placed the well-known Trevaskis mine on Red Hill, near this city, on the London market a few months ago, received word this morning from his partner that all the stock had been taken by English capitalists, and the coin therefor had been paid into the bank. Parties from London will reach this city soon, and in the meantime work will be commenced upon the property under the direction of Mr. Treadwell. There is to be no half-way business about the working of this property and ere long a large number of men will be employed. The mine has heretofore yielded a large amount of the precious metal and the future will demonstrate that this property, which has been worked on a very small scale in the past, will be a handsome dividend payer.

THE BIG TUNNEL.—The *Tidings* bears that the Gold Bank Tunnel Company will come into possession of the Jones' Bar property, in the South Yuba river. It is considered that this will be a favorable site for the mouth of the tunnel, as it furnishes good dumping ground, and gives room for mills. It is also said to be a mile nearer the rich mineral belt, which it is the object of this tunnel to tap. As the tunnel must cut its way through hard syenite and granite, this is an important consideration. The mouth of a tunnel at Jones' Bar would also be 200 feet lower than the point where the tunnel was formerly designed to start, viz, Hoyt's Crossing. This is equivalent to almost 500 feet on the incline in Grass Valley mines.

If anything is to be done with the Gold Bank Tunnel or its resultant project, this would seem a favorable time. Never has there been such activity as now in quartz mining in the district effected. The project seems as feasible as the Sutro Tunnel. As was intimated in a former article in the *Tidings*, there are now two distinct tunnel propositions on foot. It would please the mining people of Nevada County to see one or the other pushed to a successful issue. A tunnel from the South Yuba River which would drain the Nevada City and Grass Valley mines at a depth of 1200 to 1400 feet, and which might also open up numberless veins of gold-bearing quartz, would be a grand thing.

Mono.

MINERS' MEETING.—At a recent meeting of Bodie miners and mine owners, A. Lazard was elected mining recorder to fill the vacancy caused by the death of L. Lewis.

MAMMOTH MILL.—The new twenty-stamp mill will be running by Dec. 1st. About thirty men have been employed till recently, when a draft was made.

San Bernardino.

The Holcomb Valley Mill and Mining Company will, it is reported, soon start up a new mill at their Holcomb Valley mines, north of Redlands. The new mill will have a capacity of fifteen tons a day, and there are now about 400 tons of ore on the dump which runs from $15 to $20 a ton.

San Diego.

REPOTED BONDED.—The American Girl group of five claims, near Ogilby, is reported bonded by Lowman & Johnson for $120,000, to an English syndicate.

REPORTED BONDED.—Messrs. Johnson, Olson and Mead are reported to have bonded the Homestake, Black Hills, Stonewall, Comstock, Good Hope and Aurora gold mines, in the Ogilby district, to George C. Tildeu of Colorado for $45,000.

LOCATION AND TRANSFER.—C. B. Richards, C. L. Josselyn, C. Jaynes and S. Clark, says the San Diego *Sun*, have in the office of the county recorder a notice claiming the location of the Double Standard mine, situated in the White Gold Basin of the Picacho district. In the same connection, a transfer is made by which Miguel C. Marlinze sells the Silver King mine to Josselyn and Edwards.

Shasta.

IRON MOUNTAIN.—*Free Press:* The number of men employed by the Iron Mountain Railroad Company is being increased daily. There are now six or seven camps of graders established along the line of the road.

AFTERTHOUGHT.—There are some indications of work on the Afterthought mine being resumed. The mine has been idle twelve years and the mill is now wholly dismantled. A number of mining men have inspected the property lately.

THE EMPIRE.—The Empire Mining Company at French Gulch has already expended $20,000 in prospecting the mine and repairing the machinery. Their old mill is a small 4-stamp affair, but the company has recently purchased a new 5-stamp mill, which is expected to arrive shortly. The four stamps ground out $1,900 in gold last month, and a six-pound brick was shipped to San Francisco Wednesday.

Siskiyou.

HUNGRY CREEK.—Patterson Bros. of the Hungry Creek district are reported to have struck rich dirt up their high channel, finding heavy wash gold. They took out $200 in three days last week. In the same district McBride & Little are taking out some money, working the China claim. Montgomery & Son are drifting on their placer ground and doing well. The Sterling mill and mine will, it is thought, be operated by Colorado mining men.

Tuolumne.

AT CAMP WILKINSON. — *Democrat:* S. S. Badger has increased his force of men to thirty-five, and put in larger pumps, and expects to shovel out gold from the river bottom until January.

SAN GUISEPPE.—W. G. Whorf has taken hold of the San Guiseppe mine again. The water is being pumped out of the mine, and everything is being arranged for the vigorous working of the property.

NEVADA.

GOLD HILL MINES.—A 10 cent assessment was levied on Seg. Belcher on the 12th. The weekly letter says: On the 300-foot level the joint Belcher and Seg. Belcher east crosscut from the south lateral drift is out 14 feet; the face shows porphyry.

Have hoisted during the week and stored in the ore house at the mine 11 tons of ore, the average top car samples of which show an assay value of $22.16 per ton.

ESMERALDA COUNTY.

SILVER PEAK.—Three 18-horse teams are hauling ore, twenty-five tons each load, from the mine, a distance of nine miles.

The mill battery consists of thirty stamps, with a self-feeder for each five stamps; eighty tons of ore is crushed every twenty-four hours. The cyanide process is used in extracting the gold. There are seven iron tanks, capacity eighty tons. Each tank is allowed to stand seven days after being charged and there being seven tanks, one is charged and discharged every day in the week. About eighty tons of tailings, which average $7.50 per ton, is being reduced by the same process each day. The tailings from the old mill are estimated at 250,000 tons. There are about thirty-five men employed in the mine and about twenty around the mill. It is claimed that there is 13,000,000 tons of ore in sight in the mine; the ledge is from 50 to 100 feet wide.

LINCOLN COUNTY.

SOLD TO THE MARIE.—It is stated that the interests of Messrs. Monagban and Murphy and others interested with them in the El Dorado Canyon vicinity have been sold to the Marie Mining Company. The sale includes six millsites and twenty mines, and the Marie intends putting up an electric plant and all the latest appliances for handling ore.

OREGON.

IN GRANITE DISTRICT.—In the Granite mining district, Mr. Grant, representing a Salt Lake syndicate, is reported "buying everything in sight"—placers and quartz claims alike. He has already picked up a big lot of mining property and is preparing to operate. He is putting in a $7000 steam shovel, which will be used in working over some placer ground near Granite.

FROM THE ASHLAND MINE.—*Tidings:* Thos. James, foreman and superintendent of work at the Ashland mine, went to Vallejo Junction, Cal., Friday, with two carloads of ore from the mine for reduction at the Selby Smelting Works. There were 26 tons in the shipment.

WASHINGTON.

MOVED TO PESHASTIN. — The stamp mill belonging to the California Mining Company, which has been stored in Wenatchee for several weeks, has been moved to Peshastin. It is understood that the mill will be set up and put in operation and that the company has found something pretty good.

THE OKANOGAN COUNTRY.—The Grey Eagle Mining Company is the only company now operating to any extent, the ore, which is said to average $20 per ton, is milled near by in a mill leased by the company. The vein is about six feet wide, free in both walls. The walls are porphyry and granite. The vein is continuous and regular with a dip of about fifteen degrees from the perpendicular and having a strike nearly east and west. The cost of mining and milling is estimated at $6 per ton.

BRITISH COLUMBIA.

PROBABLE CONSOLIDATION.—The Trail Mining company, who own the Columbia, which adjoins the Kootenay on the west, are willing to compromise their differences with the Kootenay people and consolidate both claims into one company. Martin King, one of the owners of the Columbia, has gone to Chicago to confer with his company on the proposition.

TWO SMELTERS TO BE BUILT.—A. E. Humphreys, speaking of his Trail creek properties, says: "It is the intention of the Crown Point, Iron Horse and Kootenai mining companies to put in the next year in developing the various properties and put them in shape to commence shipping ore. When this has been done we will build a smelter at Trail Landing to treat the ores. Until the plant is ready for operations, however, I expect we will send the ores from the Crown Point and Iron Horse to the smelter which is now being built by Mr. Heinze at the Landing."

KASLO AND THE SLOCAN.—The concentrator at Three Forks is reported turning out a carload of concentrates a day. The Pilot Bay smelter has turned out 1000 tons of hullion since the 1st of June.

The narrow-gauge road from Kaslo to Sandon, twenty-five miles in length, has ten miles of track laid, nearly all the grading done and will be finished before the 1st of November. Its completion will put the Slocan Star and other mines in direct connection with the steamers on Lake Kootenai.

The Canadian Pacific is building a branch from Three Forks to Sandon. This will give Three Forks mines two outlets, one by way of Nakusp and the Columbia river, the other by way of Kootenai lake.

ALASKA.

THE TELLURIUM AND MT. KING.—Lytton Taylor, of Juneau, representing Eastern parties, is reported to have bought the Tellurium group of fifteen claims on Admiralty Island for $50,000, and the adjoining Mountain King group of eleven locations for $20,000. A 10-stamp mill, hoisting works, etc., is to be put in.

IDAHO.

MINES NEAR MURRAY.—The Daddy Gold Mining Company, G. W. Coplen, manager, have a ten-stamp mill and employ thirty men. They are driving three drifts. The lower one is in 370 feet, while the upper are 260 and 100 feet respectively, opening about 300 feet of stoping ground. They have a ten-inch vein of friable ore, which they claim runs about $12 per ton. In taking out the ore it is necessary to break down about 24 inches of waste. In order to save handling, this waste is run through the mill, which makes the ore seem lower grade than it really is. This mine has for milling purposes 1500 tons of ore on hand and enough ore in sight to run the mill at its present capacity (25 tons daily) for twenty years. In this mine the ore runs quite evenly, but occasionally strike a pocket.

The next claim above, on the canyon, is the Mother Lode. This is a ten-stamp water power mill. Owing to the scarcity of water, they are only running five stamps.

The Golden Chest Mining Company Jno. Coumerilh, lessee, on the opposite side of the gulch, has been successfully operated for the past four years with N. M. Gregg as superintendent. This mine was discovered in August, 1883, by A. D. Coplen, present assayer of the Daddy mine. They have a ten-stamp mill and are building another of same capacity at the lower tunnel and will operate both mills as soon as the machinery can be put in place. This property has a vein of ore averaging five feet in width and plenty in sight to run both mills two years. They will soon have fifty men on the pay roll.

THREE FEET OF ORE.—The Red Cloud has three feet of ore in the face of the advanced workings.

The mill is to be removed from the upper workings to the tunnel level when the company will resume regular shipments, with the expectation of a monthly average of 300 tons.

MOSCOW MICA MINES.—The Rodgers Mica Mining Company of Cleveland, Ohio, with property near Moscow have begun operations at the mines, having sold all the stock desired. The product will be shipped direct to Cleveland. Capt. E. E. Rodgers is superintendent. The Silver White Mica Mining Company, of which Capt. Rodgers is president and manager, will resume operations in a few days running a tunnel to the vein. The company is well equipped with funds and expect to continue work all winter.

A BIG MINING DEAL.—The Boise *Mail* is authority for the statement that F. F. Corning of New York, and H. H. Daniels of Denver, representing a French syndicate, have bonded the Black Jack, Trade Dollar and other mines, in Silver City, and that a company will be organized in New York to build a railroad from Butte, Montana, that would run south through Idaho to Silver City.

THE YELLOW JACKET.—Lemi *Republic:* N. A. Bihikov has made a thorough examination of the Yellow Jacket Co.'s mines, and says the mines are an immense body of fine ore, which would average about $15 per ton. According to his examination and measurements there must be in the neighborhood of 500,000 tons of ore above the lower tunnel. The company will soon have sixty stamps dropping, which will increase the mill's capacity to 200 tons per day.

THE BLACK HORNET.—The Black Hornet mine, near Boise, has been bonded to H. W. Barry of Denver for $100,000 for ninety days.

MONTANA.

THE CLIPPER GROUP.—The Clipper group of mines near Pony, owned by Elling & Morris, and the mining interests adjoining this group, owned by H. C. McKaskle are sold to an English company for $350,000, of which considerable has already been paid.

The English capitalists who are now negotiating for the mines are prepared to expend considerable in getting things in shape. It is understood they will proceed to erect a 100-stamp mill about three-quarters of a mile from the Clipper group, and will also construct a tramway similar to the one at the Bimetallic mines in Granite county.

THE ELIZABETH PROPERTY. — The stockholders in the Elizabetb Mining Company have received a circular from L. M. Rumsey, president of the company, in which a plan is suggested to redeem the property by the payment of three cents per share.

The Elizabeth property was recently sold at sheriff's sale for $31,900 to satisfy a judgment of $8,533.67 held against the property by the Union Trust Company of St. Louis, and there is now $23,175.23 in the treasury, which amounts to about four cents per share, and this amount will be turned over to the stockholders in the event that the redemption is not made by the plan of the late circular.

The plan of redemption is to organize a new company under the laws of Montana, which would make the stock assessable, with a capital stock of $5,000,000, to be known as the Alameda Mining Company. It is proposed that each holder of stock in the Elizabeth company forward his stock to L. M. Rumsey with proxy entitling him to vote it for a reorganization and to sell the assets of the Elizabeth for a sum sufficient to redeem the property sold at sheriff's sale, and to pay all other debts against it; the stock also to be accompanied by three cents for each share turned in, which sum will go to pay the judgment of the Union Trust Company.

EXPERIMENT WITH CYANIDE.—Experiments with the cyanide process are about to be made at the Voltaire group of mines, located some four miles from Fort Maginnis, in Fergus county. If it can be shown conclusively that the ores from these mines can be worked by the process, it is proposed to erect a big cyanide mill and to start in on extensive operations. Mining experts who have examined the ores from the Voltaire group say that the rock can be successfully treated by the cyanide process. Burr Clark, a noted cyanide specialist, will have charge of the experiments.

UTAH.

THE GOLDEN GATE.—*Tribune:* The Golden Gate, which has now acquired a depth of over 300 feet, has proven up a strong vein between well-defined walls. Ores are found that assay from $150 to $900 a ton, while an average value of $33.15 is claimed for the milling class.

The arsenical feature of the ore is the only objectionable matter contained in it, but the roaster will readily overcome this and pave the way to the mill, where its values will yield readily to the cyanide of potassium.

The management has not yet decided on what process it will adopt for the extraction of the metal, but will in a very short time, when the erection of a plant will begin.

THE DALY-WEST CONCENTRATOR.—Salt Lake *Tribune*, 10th: Action was taken late yesterday afternoon by the management of the Daly-West as to the awarding of the contracts for the machinery for the new concentrator for that body. The bids were opened on last Friday, but were so variable in their general terms that each bid had to be analyzed. The contract was finally awarded to the Risdon Iron Works of San Francisco, and that concern will be placing the machinery on the ground within the next sixty days. The plant will have a capacity of 125 tons per day. The power of the plant is now double the above figures, and the plant will likely be enlarged before it is a year old. The foundation for the mill is now in and work on the superstructure is under way.

NEW MINING COMPANIES.—The Vanderbilt Mining Co. has incorporated at Salt Lake; capital stock $150,000. Incorporators: I. Brockbank, E. Morris, J. R. Isaac, J. W. Fox, Jr., I. Jennings, E. Rushton, C. W. Hardy and T. Winter. Arnold G. Giauque, secretary. The company owns the Vanderbilt, Concordia, Center and Star mining claims in the Mineral Hill mining district in Blaine county, Idaho.

The Occidental Mining Company, capital stock $250,000, has incorporated. Incorporators: M. A. Jones, J. Dern, E. H. Airis, F. Pierce and H. Buhring. The company owns the Occidental, Adrian T. and Elizabeth claims in the Camp Floyd mining district in Tooele county.

NEW MEXICO.

COPPER PROSPECTS.—N. S. Berray, who has done much toward the development of the copper mines at Globe, Arizona, has taken charge of the copper mines at Copper Flat, near Fort Bayard, and has started development work upon the property by four shafts and inclines. Fifteen men are employed upon the mines and the force will shortly be increased.

ARIZONA.

AN ADVANCE ALLOWED.—The Tucson Smelting Company has allowed an advance to its patrons from $1.45 a unit to $1.79 a unit on say twenty per cent ore. The present quotation of $12.30 is equivalent to $1.90 a unit, so that the advance is nearly $9 a ton, or about 33⅓ per cent, a sufficient inducement to create activity in the copper mines of that region.

THE COARSE GOLD MINE.— Prescott *Courier:* The Coarse Gold Mine, formerly known as the Mexican mine, near Wickenburg, is again

rning out many handsome gold nuggets om its 30 foot quartz ledge.

AT GOLDFIELD.—The new mill on the Bull g mine at Goldfield, Ariz., has been coated nnd started up. There is enough ore sight to keep the uew mill running night d day for a year, but prospecting for more e will go on.

COMING TO THE FRONT.—Harshaw, the old ver-mining camp twelve miles southwest of ittenden, is reported again prosperous, a mber of rich claims being worked. A new dy of ore is said to have been discovered in e old famous Treuch mine, and at the pres- t time over one hundred mea are being nployed on it. The Trench Is one of the lest kuown mines in Arizona and is said to ve been worked by the Aztecs hundreds of ars ago. In those days they used the coiled winding stairway, walked down into the pths of the earth and carried out the pay rt In buckets on their heads.

OUTPUT AT THE MINERAL HILL.—With the vent of the Tucson smelter the Mineral ill property, eighteen miles distaut, is producing copper. The force is eighteen men. ext month it will be increased to nearly 100.

COLORADO.

THE TOM BOY.—The Tom Boy Gold Mines ompaay produced betweeu $85,000 nnd $90,- 0 in the month of July, says the Telluride *epublican*. Of this $75,000 was caught on the ates by amalgamation and shipped out in old bricks nnd the rest carried by the concentrates. Enough of this kind of ore is blocked t and in sight in the mines to supply the ill at the present rate of cousumption (150 ns per day) ten years.

LEASING MADE IT.—The leasing system has oven the salvatiou of Cripple Creek, says o Denver *Republican*. Companies who owned ound nnd individuals who had more claims han they could possibly attend to leased hem to miners who proceeded to develop the roperties with all speed. In a good many iuances the leases were for short terms, and he aim was to get out as much ore in as short me as possible. The lessees were largely esponsible for bringing about the revival hich hecame noticeable about March or pril last. They were able to give employent to a force of men as the returns for the e came in.

When the originnl hoom started over three ears ago the rule was to get possession of a iece of ground as large as possible, sink a few et and start a company. If the stock sold he development was continued, and if it was nsalable there wns little more done. The ompanies that had really valuable ground ften employed inexperienced men to take harge of it, and the result was that for some me the camp was retarded, Then some of he concerns decided to try the leasing plan, nd it was so successful that others followed. he individuals and the companies that leased heir prospects were benefited, and the camp egan to pick up. The lessees were in almost every case practical miners acquainted hore or less with the mineral, and they were he very people to make the most of it. With he unsettled condition of affairs that followed the strike a number of owners decided o lease their ground also, so that until rently the lessee on nearly every portion of he district was the rule.

Of late a good many of the leases that have un out are not being renewed, as the owners re beginning to come to the conclusion that hey can have the mining done under their wn direction. A lessee doos not do any more evelopment work than is absolutely necesary to get at the ore, and while he gives a nine a good start it is found to he better not o continue a property too long under that ystem, and the conditions that existed when he leases were granted have been more or ess removed. But the system will continue, o a greater or less extent, in the camp for ome time. There are numerous instances where a mine could uot he worked by the wners, but where the lessees were enahled o pay goodly sums in royalties and make big wages for themselves.

The lesseos are prosperous and have money o spend. When the system started they had o club together to get sufficient to live on, nad they had to keep the men who were working for wages poor, too, as the latter often supplied the gruh stakes. The business men complained at that time that the leasiug system was affectimg all kinds of business, and probahly they were right, but there is no complaint of that kind now. The lessee is an important member of the eamp.

MINING SALES.—Cripple Creek *Mail:* Senator Tahor has an $85,000 option on the Free Coinage group, having paid $1,000 cash.

A $70,000 option has heen given on the Morning Star and Burns, property of the Calumet company.

The O. K. has been bonded to the Golden Ridge company on a two years lease. The shaft will he put down another fifty feet.

Application was made hy cahle from Paris a few days ago for an extension of thirty days on the option given on a controlling interest of the Isahella stock at 40 cents. President Hagerman refused.

The Calhoun Gold Mining Company has purchased the Ithaca tunnel site which cuts Battle mountain and ends on the Trail property on Bull hill. Manager R. G. Tucker has plenty of money at his command and will push the hore to its completion.

LOWER CALIFORNIA.

RICH MINE SOLD.—Senor Corrales, who with Manuel Riveroll has been developing rich gold claims at Zaragoza, forty miles east of Ensenada, has sold his half interest in the property to B. L. Harding for $15,000 cash. Mr. Harding, of Ensenada, will purchase machinery which will he put up at the mines and developing continued. Other claims in the district are owned hy Americans and Mexicans, who consider the Zaragoza country one of the richest on the coast.

Coast Industrial Notes.

—Men are at work buildiug n dam across Douuer Lake creek, for the purpose of backing up the water over a large area of grouad. Extensive lce works are to be built.

—The governmeut dock at Fort Orchard, Wash., is about completed, and will he open for ships as soon as the chanuel te it is dredged out, which will probahly he about Dec. 1st.

—The South Yuba Corupauy will have their electric power in Sacrameato early in Novemher. They are now lighting the towns of Auburn, Rocklin, Penryn, Newcastle and Rosevilla.

—The Agricultural aad Iadustrial Association of British Columbia is holding its annual exhibition aud celebratiou at Victoria from Sept. 16th to Sept. 21st inclusive. Five thousand dollurs in prizes are offered.

—The Nevada Southern Railroad is about to pass into the hands of meu who will extend it through Lincoln county, Nevada, where considerahle base metal can be handled profitably with better means of trausportation. The ultimnte idea is to build to Pioche and on to Milford, Utah.

—"Steep Gradients on Electric Roads" is the title of a well written and handsomely illustrated article in the August issue of the *Electrical Journal*, largely descriptive of the 25 per cent Fillmore-street grade in this city, where the steep grade is overcome hy the use of au nuxilinry cahle.

—The Ceutral Lumher Co. has filed articles of incorporation here. It includes nearly all the big mill owners, the intention being to establish a big pine lumher trust and fight the British Columbia mills, which, sinee the tariff was taken off lumber, have made the husiness unprofitable in California.

—There is under consideration a scheme for making use of water power in a canyon above Healdsburg to supply Santa Rosa with electric euergy sufficient for manufacturing purposes. The plant, it is estimated, will generate from 2000 to 5000 horse power. The current will he sent to Santa Rosa via Healdsburg aad Windsor over ten wires, five being used at one time.

—The Southern Pacific management, after a careful survey of the field, has come to the conclusion that throe harrels of oil will do the work of one ton of coal. The oil can be obtained at the present time for forty cents a harrel, or $1.20 for the three harrels, as against $4.82, the cost of one ton of coal, so that the expense of fuel upon that system would he reduced from $3,446,623.36, the cost of fuel in 1894, to $862,150.80 per year, a saving of $2,584,467.52, provided the relative values of the two fuels remained the same.

—*Wood and Iron* reports that the receipts of lumber in the bay of San Francisco from all points for August of last year were 27,435,293 feet and in August, 1895, 26,950,548—a falling off of only 484,745 feet. The receipts from the Sound ports and Oregon for the past month were but 16,030,053 feet, as against 20,453,000 feet in August of last year. Del Norte county shows an increase of 140,912 feet, Humholdt an increase of 201,364 feet and Mendocino an increase of 3,595,926 feet. Thus the falling off in receipts of pine, spruce, etc., was almost made up hy the increase from the redwood mills.

—John T. Davis, of Los Angeles, makes a loud call for a smelter in that city, and figures that the silver-lead ore along the line of the A. & P. R. R. should he smelted in Los Angeles instead of being hauled to El Paso, Denver or Kansas City. Ahundance of ore is procurable with 51 per cent lead, 29½ ounces silver, $4 gold. The lead at 90 per cwt. of New York quotations, and the silver at 60 cents per ounce, would give as follows: 1020 lead at $3, $30.60; 29½ ounces silver at 60 cents, $17.70; gold, $4; total, $52.30. The ores at Los Angeles would cost as follows: Mining, $3; hauling hy team, $10; railroad transportation, $8; treatment charges, $4; total, $25; making a profit of $26.70 per ton.

—Los Angeles, says the *Manufacturer*, has six foundries, employing in the busy season from 400 to 450 men, and will during the year 1895 turn out close on to $1,500,000 worth of manufactured iron. This product will he largely increased, as the demand is now felt from fields which had previous to the discovery of cheap fuel heen considered out of the question. Pig iron is worth $24 per ton laid down there. All of the foundries are using, or preparing to use, fuel oil from the Los Angeles wells. The iron and steel works use seventy barrels per day, or over 25,000 harrels per annum, and find it most satisfactory in every way, notahly in the great saving in expense over coke.

—The reorganization of the Oregon Railway and Navigation Co. embraces the formation of a new corporation, which will issue $24,500,000 four per cent bonds, to be a second mortgage on the property covered hy the present first mortgage and a first mortgage on all the other property of the company. The new company will issue $11,000,000 four per cent non-cumulative preferred stock and $24,000,000 common stock. The common stock for the new company will be issued share for share to the present common stock on payment of six per cent assessment. Under the proposed plan the fixed charges of the new company for the first year of its operation will approximate $930,480, as against present fixed charges of $1,305,250.

—The most celehrated Peruvian railway is the Ferro Carril Central del Peru. Starting at the docks in Callao, it keeps rising until, at 106 miles from the coast, it reaches a height of 15,666 feet. It then descends, and in thirty miles falls 3489 feet. When completed, 264 miles farther, it will reach the navigahle waters of the Amazon, and this extension will probably not cost more than half as much as the finished portion. There are eight switchhacks on this road, four of them being double. There are fifty-seven tunnels in a distance of twenty-four miles, mostly through rock spurs. Work was begun on this road in 1870, the track being laid to Chicla in 1875. It was resumed in 1890, and the most difficult and important part of it, containing the two largest bridges and eight of the tunnels, being at an altitude of over 15,000 feet.

—Philip Weigel of Jersey City, N. J., says that three men in this country, of whom he is one, have planned to buy the entire interest in the Inter-Ocean Panama Canal Company, taking up the work where it hnd been left off und prosecuting it to a successful end. According to Mr. Weigel, the syndicate will begin work within the next eighteen months. By that time, he said, the privileges and grants held hy the present Panama company will have expired; and arrangements having been made with the United States and other governments to extend these privileges, the work will go on with vigor. Mr. Weigel said the agreements, releases and other accessories to the transfer have been drawn up, and the new company has simply to deliver the contract price to be in full possession.

—C. P. Huntington of the Southern Pacific is of the opinion that the Nicaraugua canal will never be built, and he gives these reasons for so believing: "We have three or four billions of dollars in eastern or western railroads in the United States, which can do the business contemplated hy way of the canal better than this can be done in any other way. Besides the fact that tolls would be exorhitant for the canal passage because of the large amount of interest to he paid in the cost of construction, we must bear in mind the extreme importance of the question of insurance of vessels and cargoes. The freight to San Francisco is only about one-fifth the insurance on certain lines of goods around the Horn. The business of the Suez canal and the importance of that artificial waterway furnish no precedent in behalf of the Nicaraugua canal." But it will he built just the same. It is a clear case of manifest destiny.

Personal.

H. P. GORDON, who for the past year has been superintending the operations of the Caravicha M. Co., in Ecuador, South America, has returned, and is at present at Plymoutb, Cal.

R. M. CATLIN, tho mining engineer, follows fourteen other Californians who have gone to South Africa at handsome salaries to take charge of gold mining properties in the vicinity of Johanneshurg.

JOHN PELTY, representing the Angostura M. Co., is traveling through Nevada and Placer counties, getting experienced hydraulic miners for the company's mines in Ecuador, South America.

HERBERT LANG, whose article on matte smelting in the issue of this journal of Jan. 12th is still in great demand from all parts of the world, is at present in Oakland, where he is superintending the plans of the smelter for the Iron Mountain Co. of Shasta.

CLARENCE KING is on Fruit Creek, Baker Co., Oregon, reporting on the Columhia mine, owned hy the Cahle Bros., to P. Blackmar of Chicago, W. J. Shedd of Denver and E. S. Field of Baker City, Or.

ISAAC BANTA, formerly an Albany, Or., gunsmith, and more recently in partnership with Messrs. Wink and Burton at Port Orford, Or., claims to have an offer of $50,000 from the Nicaragua Mining Co. for the right to use his gold extraction process, and will shortly sail for Bluefields to show the Nicaragua people how to use the secret chemical mixture that he says makes unnecessary the use of mercury.

Obituary.

W. R. RANDALL, late foreman of the La Bellevue mine, Baker City, Or., died there on the 26th ult.

DR. HENRY LEIPMAN, manager of the North Pole Mining Company, at Bourne, Oregon, died last Saturday after a brief illness. His death is said to have been caused by the inhalation of cyanide, he having used the drug in treating ores hy the cyanide process.

JAS. TULLOCH, an old-time miner and a prominent man in his section, died at Angels on the 6th inst., aged 73. He was a native of Richmond, Va., and for nearly 44 years was engaged in mining in this State. He was the inventor of the Tulloch ore feeder and Tulloch concentrator, and at the time of his death was the principal owner in the Tulloch mine.

EDWARD W. JACKSON, general manager of the Interoceanic Railway of Mexico, died in the City of Mexico, September 2d, after a week's illness. He was horn in London, England, in September, 1838, and entered railway service in Turkey in Asia in 1858. He located in Mexico in 1864, where for over 31 years he was prominent in railway construction and management.

Commercial Paragraphs.

THE Replogle Governor Works, owned by the Selle Gear Company, of Akron, O., has purchased the governor business of H. E. Olhrich, of Cedar Falls, Iowa, including all patents, patterns, etc., pertaining to electric regulators. This company has also purchased recent patents granted to Mark A. Replogle and others, in this line, and will establish itself in a business wholly devoted to the governing of water power for the various uses to which it is applied.

THE Bucyrus Steam Shovel Company, South Milwaukee, Wis., will shortly he taken out of the hands of receivers George and Eells, who have had charge of the business since last January. It is understood that most of the creditors will take an interest in the company for a part of their unpaid claims. At the time of failure Mr. Eells stated that the nominal value of the assets on Jauuary 1, 1895, was $461,841.92 and the liabilities were $259,665.55, leaving a surplus, in nddition to the $150,000 capital, of $52,176.27.

Publications Received.

"The Lixiviation of Silver Ores with Hyposulphite Solutions, with Special Reference to the Russell Process," by Carl A. Stetefeldt; second edition.

In his preface tho author modestly states that "some errors which occurred in the first one have been corrected, irrelevant matter has heen left out and a great deal of uew matter ndded." The fact is that the work is practically a new one, and is au admirable up-to-date treatise on a subject about which so much has been written. The introduction contains n brief history of the lixiviation process, a condensed account of the Russell process, a comparison of lixiviation with amalgamation, etc. Part I is devoted to the chemistry of the lixiviation process; part II, the lixiviation process in its practical execution.

There is no theory or assumption. The first part deals with matters as exact in their results as the multiplication table; the second part gives statements of what has been done aud how. The hook gives tahles of costs of treatment, results, etc. It is published and sold in the United States and Mexico by its author, Carl A. Stetefeldt, 967 Alice St., Oakland, Cal., price $5.00, postpaid.

"Journal of the Franklin Institute," Philadelphia, for September.

The principal article in this number is the report of the Committee on Science and the Arts on the Pelton Water Wheel, in which that wheel is fully described and discussed. Altogether, thirty-seven pages of this issue are devoted to this water motor, with diagrams, wood cuts and sectional views, the report concluding with the formal award of the Elliott Cresson Medal to Lester A. Pelton, the inventor of the wheel. Included in the space devoted to this subject is an appendix of thirteen pages of historical notes and data regarding the Pelton wheel and other water motors, concluding with a commendatory report of tests of Pelton water motor No. 4, made by Lieut. Haeseler, U. S. N., and Ensign Bullard, at the U. S. Naval Academy last March.

Other articles are on "Asphalts and Bitumens," "Rainfall and Typhoid Fever" and a valuable monograph on "Investigation of Utah Gilsonite," hy Dr. W. C. Day. The notes and comments are, as usual, of technical value.

"Journal of the Association of Engineering Societies for July, '95."

The principal paper is "Timher-Preserving Methods and Appliances," hy W. G. Curtis, read hefore the Technical Society in this city Dec. 7, '94. Other papers are Cost of Steam and Water Power in Montana, Wooden Bridge Construction on the Boston aud Maine Railroad, and the Engineering History of a Lawsuit Respecting a Contract for Railroad Building in South Dakota.

"Centrifugal Pumps; An Essay on their Construction and Operation, and Some Account of the Origin and Development in this and Other Countries," by John Richards; The Industrial Publishing Co., 40 California St.; Price $1.

The sixty-eight pages of this practical treatise disregard much that has been hitherto accepted as pump gospel, or refer to it only to controvert and antagonize it, the idea being from the author's standpoint to state what is expected of a centrifugal pump and how best to construct it that it may economically do its required work. The first part treats of construction and operation, the second is mainly a history of the centrifugal pump, it being shown that as a practical operative machine it is distinctively an American invention, a pump embodying nearly all the essential points of that of to-day, having been invented in Massachusetts seventy-seven years ago. The history of the different improvements, additions and special applications is given, with special reference to local manufacturers and requirements. An appendix embraces several communications from engineers, makers and users of the centrifugal pump on this coast. The work is illustrated by drawings and diagrams, and handsomely issued.

Catalogues Received.

THE finest catalogue received this week is from the Joshua Hendy Machine Works, 38–44 Fremont street, San Francisco, being the second edition of Catalogue No. 2, 132 pages, 6x9½ in. It contains practical suggestions to managers of mines, millwrights, amalgamators and millmen; illustrated descriptions of ore-cars, grizzlies, rock breakers, ore-feeders, stamps, mortars, screens, the Triumph concentrator, amalgamators, settlers, gold and silver mills complete, engines, boilers, pumps, water-wheels, with sizes, prices, tahles regarding every variety of metal mining machinery, workshop recipes, weights and measures, ordinary engineering formulæ, etc.

Alcatraz Asphalt and Its Uses, 6x9 inches, 40 pages, from the California Petroleum and Asphalt Company, San Francisco. A handsomely illustrated treatise on California's asphalt heds, and the value and utility of the company's product with analyses, testimonials and information regarding method of mining, transportation, etc.

Scientific Progress.

Lord Kelvin's Judgment on Alternating Currents.

Some interesting correspondence, origiually appearing in the London *Times*, is being collected and reprinted. In a short description of the great power plant at Niagara, George Forces, chief consulting engineer of the Cataract Construction Company, remarked that when he advised the adoption of "alternatiug currents (which had not then been practically used for power purposes), many predicted failure, and some, including our friend Lord Kelviu, have continued to do so." The distinguished foreigner here mentioned is England's greatest all-round authority in science, although he is not a specialist in electrical matters, and it was natural that Mr. Forbes should plume himself on his success in the face of such discouragement.

But Lord Kelvin did not allow the charge against him to go unnoticed. He replied, through the *Times*, with a partial denial. He said: "I told the directors that they would certainly succeed with alternate currents, but much better with continuous currents." Mr. Forbes insists, however, that in 1892 Lord Kelvin declared, in a cable dispatch, that the adoption of alternating currents would be a "fatal" or "disastrous" mistake, and in other ways evinced marked disapproval. The first vice-president of the Cataract Construction Company, Mr. Stetson, takes the matter up next, and says that in 1891 Forbes and a Buda Pesth firm alone favored alternating currents, while Kelvin and all the other members of the Advisory Commission employed by the company reported adversely; that iu January, 1894, the directors decided, nevertheless, to adopt the alternating current, and all of the original dissenters except Kelvin concurred in this policy. Thereupon, apparently after he had discovered that he was out in the cold, the eminent Englishman sent a dispatch, still evincing a strong preference for the continuous current, but intended also, as Mr. Stetsou says he is now (evidently for the first time) able to discover, to admit that alternate currents might succeed.

It is certainly fortunate that a loophole was thus provided for Kelvin's withdrawal from what would otherwise have proved to be an exceedingly embarrassing situatiou. The Niagara installation is now recognized everywhere as a brilliant engineering success. Sylvanus C. Thompson, a compatriot of the lately ennobled Sir William Thompson, writes to the *Times* politely but distinctly disparaging the latter's judgment. This verdict has the greater weight because, instead of devoting his attention to a number of 'ologies (like the subject of his criticism), Prof. Thompson has concentrated it chiefly upon electricity and magnetism, and upon those particular subjects his views are regarded with universal respect and reverence among practical electricians. He says: "Lord Kelvin's prepossession in favor of continuous currents as against alternating currents is not supported by modern electrical practice, save for the restricted purposes of electrolyte decomposition. On the contrary, for nine-tenths of all other purposes the advantage is found to lie on the side of alternating currents, wherever the distance of transmission exceeds a few hundred yards."

The thunder storms of Madras have been studied by Prof. Michie Smith, who tells the Scottish Meterological Society that the first striking fact he observed was that of certain seasons of the year when sheet lightning was seen almost every night, always in a west or southwesterly direction, aud always near the horizon. He suggests that these discharges occur in the region where the moist and dustless sea wind meets the dry and dusty land wind, one being perhaps positively electrified and the other negatively. It is not easy to explain exactly lightning displays in which as many as 300 flashes per minute have been counted, this rate being kept up for an hour or an hour and a half. The idea that sheet lightning is a reflection from a distant storm is nonsense. Another interesting peculiarity of this region is that the heaviest rains are unaccompauied by thunder, while the displays of lightning are not accompanied by rain.

At the regular monthly meeting of the Technical Society of the Pacific Coast, on the 6th inst., Mr. Edward S. Cobb, 109 California St., this city, read a paper on a new wheel, now almost completed at the Pacific Rolliug Mills, of his own design, the paper being illustrated with blackboard drawings and sectional diagrams. The wheel is 17 feet 4 inches in diameter, weighs 16,800 pounds, and is so built with rim sections, radial rim-supporting spokes and driving truss rods that when in motion every part of it is in tension except one chord of the driving trusses. The rim weighs 11,500 pounds, the spokes 2000 pounds, the hub 3300. At 130 revolutions per minute it is calculated the resisting power would far exceed any possibility of requirement in use or the remotest contingency of accident. Regarding cost Mr. Cobb's figures compare very favorably with those of other wheels of equal weight, strength and stability. The wheel in process of constructiou has been visited by a good many mechanical engineers and practical men, who have manifested considerable interest in its mode of construction.

The idea of a boiling solid is somewhat bewildering, but Prof. Dewar points out that we have such a substance in solidified carbonic acid, which has the singular property of boiliug at a temperature lower than its melting point. To illustrate this before an audience, some solid carbonic acid was pressed into a ball, suspended by a cord iu water in a glass trough, and an image of it projected upon a screen. Gas was then seen to be given off freely. The frozen carbonic acid was no colder to the fingers than common snow, because in reality it never came in contact with the skin when being handled. Another striking experiment—never exhibited before—was the burning of diamonds in liquid oxygen. When two or three red-hot crystals were thrown into the liquid they were at once cooled and sank to the bottom, but a diamond made extra hot by the blowpipe caught fire and burned on the surface of the oxygen with a steady flame

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Helium having been found in quantity in cleveite and broggerite, Prof. Ramsey has continued the search among the less common minerals, and concludes that the elemeut is retained by minerals consisting of salts of uranium, yttrium and thorium, but that we cannot yet decide which of these three conditions has its presence. Oxide of uranium alone seems sufficient to retain it, but it is found plentifully in monazite, which contains thorium, but no uranium, and is a comparatively cheap mineral that may become an economical source for helium. Helium has the solubility of 0.007 in water at 18°, and is, therefore, the least soluble gas known.

After a spectroscopic comparison with the gas of cleveite—in which terrestrial helium was first discovered—M. H. Deslandres announces that the permauent radiations of the sun's atmosphere that are not recognized on the earth are reduced to a single one. This is a green ray, called the ray of the corona, which is peculiar to the highest regious of the solar atmosphere, allowing us to suppose that it belongs to a gas lighter than hydrogen.

The cooler regions of the globe are becoming depopulated, and everywhere, Dr. D. G. Brinton assures us, the arctic and sub-arctic zones have fewer inhabitants than a half century ago. One cause is the destruction of native tribes by the introduction of new modes of life, new diseases, alcohol and idleness. Another influence is the fact that the Arctic regions, like the mountains, were originally chosen as homes only by refugees of conquered and dispersed bands, and all who can returu to less severe climates are now doing so. The center of population tends more and more to fix itself between 45 and 55 degrees of latitude.

Scientists predict that in a century's time there will be no disease that is not curable.

Mechanical Progress.

Prehistoric Irrigation Canals in California.

The prehistoric irrigation canals of what is now San Diego Co., Cal., attract renewed attentiou. The engiueers in charge of the work knew their business. They took advantage of the topography of the country with great skill, aud developed a maximum quantity of water with a minimum of work and expense. The source of supply was of course before them—the Colorado river. All they had to do was to lead it out across the desert. They did this by constructing the great caual now known as New river. This tapped the Colorado river thirty miles above its mouth, and was cut to the divide, which separates Salton basin from the New river country. Scientific men have visited these ancient waterways and agree that the highest type of engineering ability was possessed by the constructors, whoever they were. The savants differ as to the identity of the old-time San Diegans. Some say they could not have been Indians, and hint of Phœnician origin. This is partially borne out by the discovery of Phœnician writing on the west coast of Lower California, stumbed upon by a coast-survey party. At Corn Springs, on the desert, a spot almost entirely unknowu to white men to-day, characters were found graven on the face of cliffs that were Greek to the Indians. The pictures represent men in armor with battle-axes, and images, and ships. The maiu canal leading from the Colorado into the desert had five branches, the length of all reaching nearly 600 miles. The three easterly branches connected with the Colorado, and with each other at two points. They are from 50 to 200 feet in width and 8 to 15 feet in depth, in some places as perfect in line of curvature, excavation and grade as when first constructed. There remain stretches of miles where a flat-bottom river steamer could ruu were the canals full. So cunningly are they constructed, and so accurate is the grade, that when the Colorado river at Yuma gauges twenty-two feet at the bridge the canals are full. When the river drops to sixteen feet they are nearly dry. The most easterly of the canals run into Lake Jululu, a body of water eight by sixteen miles and eight feet deep. When the lake is full one stream runs south to the Colorado and the other north into the Indian Wells country. These are connected by a third stream, and where the westerly branch enters the third the water, when the lake is full, flows both north and south. This arrangement suggests ingenuity and accurate engineering. The finishing touch to the great system is in the reservoirs, now appearing to be lakes, which join the maiu canals at intervals. These filled when the Colorado was high, and no doubt were provided with gates through which the fluid was doled out to ranchers when the big river had dwindled to a thread. What modern irrigation system excels this for magnitude or ingenuity? That such work could be constructed argues a degree of intelligence and civilization not indicated among any of the known peoples of this coast, and that their history could be so completely blotted out proves them to be of immense antiquity. In the New river country, as in Arizona, fragments of pottery and stone utensils are found, but scientists are inclined to believe that they date from Indian tribes who came later. The natural conclusion is reached that light on the history of the world may yet come from this so-called new land, which in reality was doting with age when the savages of Britain were gnawing their enemies' thigh-bones.

The Widening Use of Gas Engines.

Some of the chief difficulties to the extended introduction of the gas engine have been gradually removed by the improvements in methods and apparatus for the manufacture of producer gas on a small, yet economical, scale. In this, as in other branches of engineering, the law of supply and demaud operates to mutual advautage, and isolated gas-engine plants are rapidly coming to the front. One the other hand, for the distribution of power from a central plant to greater or less distances gas offers peculiar advantages. There are practically no losses in distributing the gas in pipe lines, except leakages, which can effect the distribution. Losses of pressure and temperature changes do not in the least effect the economy of the gas engine at the end of the line. Therefore, the distribution of power by gas, and its utilization by gas engines, scattered over a widely extended area, may come to be a rival of the other methods. And the facility of storage and use of gas for heating are additional advantages.

It seemed doubtful for a long time whether gas engines could be made and economically managed in large units; but their present use up to 300 horse power and the contemplated manufacture of gas engines of 500 horse power and upward, leave no room for serious doubting. But it is open to discussion whether there is the same inherent gain in economy in the use of large gas engines as in the use of steam eugines. Of course, on the general principles of power production, large units are more economical per horse power than small units. Nevertheless, there is scarcely an argument advauced for the use of large steam engines that can be similarly advanced in the case of gas engines.

In the matter of arrangement of gas-engine cylinders there is undoubted preference manifested for the vertical type, and in pairs, with cranks at 180 degrees apart. Four-cyliuder or quadruplex gas engines are being seriously considered, to gaiu an additional advantage along the same lines as the two-cylinder or duplex type, namely, a greater number of explosions per revolution, and, consequently, an increased opportunity to control the supply and explosious according to the load.—W. S. Aldrich in Cassier's Magazine for September.

Electric percussion drills are not, as a rule, very well thought of by mining engineers. They were originally placed upon the market without proper tests and before they had been perfected as a commercial piece of apparatus. Extravagant claims were made for them, and the results were for this reason all the more disappointing. For the past two years much has been done in perfecting the electric percussion drill. No change has been made in the principle of the drill. The iron plunger is given a reciprocating motion by two electro-magnets in the drill body, to which a pulsating current is supplied by a specially designed generator. The mountings are in every respect the same as the standard air or steam drill. The improvements made have been in reducing the heating of the coils and in devising an insulation which could not be injured by rough usage which a rock drill is called upon to withstand.

From a ton of ordinary gas coal may be produced 1500 pounds of coke, 20 gallons of ammonia water and 140 pounds of coal tar. By destructive distillation the latter is made to produce no less than fifteen specific results, one of the most important being pitch, of which it furnishes nearly one-half. It also furnishes creosote and toluene, which contains the new substance saccharine, which is 230 times sweeter than sugar.

Electrical Progress.

Bribe Taking and Giving.

The "commission" business is not wholly unknown in California, and the following from the New York *Electrical Review* will be read with some interest. That journal claims to have accumulated considerable matter bearing on the subject of bribe taking and giving, and intimates its intention to publish it. It gives the following as actual events, "suppressing the names, dates and places for the present:"

A man who had been trusted by his employer to make his purchases of goods found himself a little short of ready money and decided that the easiest way to get it was to "sandbag" some manufacturer from whom he had been buying. He went to a manufacturer named Smith and stated that he wanted 100,000 of certain goods which he had formerly purchased in 10,000 lots. Mr. Smith asked him why he was buying so heavily, as the goods might be out of date before the 100,000 could be sold. The buyer replied that he had been purchasing goods from Mr. Smith for some time, that the house he represented was gilt-edged and that he thought it was time there was "something in it for him." He was willing to buy 100,000 of the goods now if a commission of so much (naming a figure) could be paid in cash. Mr. Smith was surprised, but politely told the buyer that he didn't do business that way and that he would go to the trouble of informing his (the buyer's) employer what kind of a man he had as a purchasing agent. He did so and the buyer lost his job.

Another case was that of an electric railway contractor who was asked to bid on some new construction work. The contractor knew that the chief engineer of the road had the deciding opinion in the matter, and from conversations with him discovered that securing the contract was merely secondary to securing the chief engineer. The contractor accordingly prepared his bid, which amounted to $16,000. He went to the chief engineer's office, pulled a chair up beside him, and, drawing out a slip of paper, wrote on it "$16,000." Then he pushed it toward the chief engineer, saying, "Mr. Sanders, I think we can do the work for that figure." Sanders looked at the slip and said, "I think it would be more satisfactory if you could do it for ——" and then he held up the same slip of paper on which, under the contractor's figures, he had written "$18,000." The contractor thus discovered that the price of the chief engineer was $2000. He bought a little hand-bag, put $2000 in bills in the bag and had a boy deliver bag and contents to Sanders, who subsequently awarded him the contract.

A case in which the biter was bitten happened in a city not a hundred miles from New York. Contracts for work amounting to over $300,000 were to be let, and all the electrical contractors knew that the first thing to be done was to "see" the chief engineer. A New Yorker—Kelly we'll call him—heard of the work and immediately took a train to ——. He had the chief engineer, Jones, dine at his hotel with him. After several small bottles and other large ones, Kelly said to Jones:

"Old man, I want this work. Tell me what to bid."

Jones went through motions and intimations until he discovered from Kelly that "there was $50,000 in it for him." Then he told Kelly to bid $312,000.

Kelly returned to New York and told his partners how he had "cinched" a big contract. The bids were opened soon after this and Kelly thought he'd take a run over to —— just to see the disappointment of the other fellows. The first bid opened was for $314,000, and Kelly smiled knowingly. Next came Kelly's bid of $312,000, and finally the third and last bid was opened. It was for $310,000, and was submitted by Mr. Crane, who also carried on his business in ——. Kelly realized that he had got the "double cross," and being possessed of considerable sporting blood, took his medicine philosophically.

On his way out of the room, an angry man approached Kelly and said: "D—n that red-headed, blankety-blank engineer! He threw me down."

"That so?" asked Kelly. "How did he do it?"

"Why," replied the other, "I offered him $25,000 if he'd tell me how much to bid to get the contract. He told me a bid of $314,000 would get the work."

"That must have been before he saw me," answered Kelly. "He told me to bid $312,000, and I was to give him $50,000. We've both been done up, my friend. I wonder what the contract cost Crane?"

Kelly and the angry man kept their eyes and ears open for the next few weeks, and finally learned the sequel of the story.

One day Jones walked into Crane's office and asked for a private interview. When they were alone, Jones remarked nonchalantly:

"I've got some obligations to meet to-day and I'm a little short. I'd like to get about twenty-five thousand."

"Twenty-five thousand what?" inquired Crane, looking surprised.

"Dollars," said Jones.

"Twenty-five thousand dollars! For what?" gasped Crane, in well-feigned astonishment.

"Why, on account of my commission. You certainly remember promising me $100,000 if I told you what bid would get that contract."

"Are you trying to blackmail me?" asked Crane, threateningly. "I'll report you to your board of directors. Get out! You don't get a cent!"

But Crane didn't report Jones, and the latter had to swallow his defeat.

THE Cataract Construction Co. at Niagara Falls is reported successfully transmitting power. As heretofore explained, the current sent out is an alternating one, and before it can be used in the making of aluminum it must be transformed to a direct current. This is done by passing through four of the largest rotary transformers ever built. These are 2100 horse power each, and three of them are running.

THE current number of the *Pacific Electrician* has a very good portrait of W. S. Heger, formerly of this city, but more recently of Wilmington, Delaware, whence he comes as Pacific coast manager for the Westinghouse Co.

THE Edison Light and Power Co. on Stevenson street are now selling incandescent lamps at twenty cents each, keyed sockets at sixteen cents and keyless sockets at thirteen cents.

IT is calculated that there are now in operation in the United States 22 incandescent lamp manufacturing companies turning out 32,500 lamps daily.

Practical Information.

THE effect of low temperature upon the physical properties of matter is very striking. For instance, it is found that the vigor of chemical action decreases and the elements apparently lose their ability to combine as their temperature is lowered. Thus phosphorus and oxygen, which so energetically combine at ordinary temperatures, become more and more chemically inert as this temperature is decreased, until at 200 deg. below the freezing point of water they appear to be unable to unite. This may be otherwise stated by saying that in the absence of heat there is no chemical affinity. Heat is known to consist in the internal vibratory motion of atoms and molecules of matter, so that it appears that in the absence of such vibratory motions there is no possibility of chemical action. On the other hand, as the temperature falls, the magnetic and electrical qualities of some or all of the elements are exalted in a proportional way. Thus, oxygen, which is feebly magnetic at ordinary temperature, becomes strongly magnetic at 200 deg.; and when liquefied, as it easily may be at such low temperature, it behaves like iron to a magnet, and will adhere strongly to its poles.

HERE is a table showing the amount of circulating medium used in nearly all the countries of the world. This table is given upon the very highest authority. France has $36.81 to each inhabitant; the United Kingdom (Great Britain and Ireland) $20.44; Germany $18.56; the United States $26.02; Belgium $26.70; Australia $26.05; the Netherlands, $24.34; China, with a population of 402,700,000, the per capita circulation is but $1.80, all silver; Roumania has $4.60; Servia $4.27; Sweden $2.71; Turkey $2.39; Central American States $3.78; Japan $4; India, with a population of 287,200,000, $3.44; Hayti $4.90; Portugal $21.06, and Egypt has $19.85 as her per capita. The South American States have $9.67; Canada $10; Cuba $12.31; Italy $9.59; Switzerland $14.48; Greece $12.22; Spain $17.14; Austria-Hungary $9.59; Norway $6.60; Denmark $11.72; and Russia, with a population of 124,000,000, has $8.17 to each inhabitant.

DR. A. M. BLEILE explains the cause of death in electric shock as follows: Death is due to the fact that the current produces a contraction of the arteries through an influence on the nervous system, and this constriction of the arteries throws in such a mechanical impediment to the flow of blood as the heart is unable to overcome. When such a drug as nitroglycerine or nitrite of amyl is given to counteract this effect, much larger doses of electricity than the ordinary can be borne. Artificial respiration may be of use in cases of simple stunning, but when large quantities of current pass, no rational means of resuscitation have, as yet, been suggested.

PURE, fresh, cold water is one of the most valuable disinfectants, inasmuch as it is a powerful absorbent. Every sick room should have a large vessel of clear water, frequently renewed, placed near the bed, or even beneath it. This not only absorbs much of the hurtful vapor, but by its evaporation it softens and tempers the atmosphere, doing away with the dryness which is so trying and depressing to an invalid, or even to persons in health, for that matter. It has frequently been shown, by actual experiment, that troubled sleep and threatened insomnia are corrected by so simple a thing as the placing of an open bowl of water near the sufferer's head.

A SINGAPORE letter to the London *Times* states that consequent upon the legislative retention of the silver guilder at the old value in the Netherlands, coining factories have been established in China and the export of guilders thence yields a handsome profit. It is estimated that $2,000,000 of such counterfeit coins are already in circulation and the evil threatens to increase.

THE extent to which a chimney can poison the atmosphere has been scientifically determined by a test made in Berlin. The soot which comes out of the chimney of a single sugar refinery was gathered for six days and found to weigh 6800 pounds.

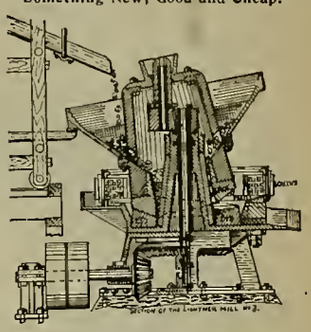
SURVEYS and examinations of the bituminous coal beds of Pennsylvania have led the government experts to announce that at the present rate of consumption the supply will not be exhausted for 800 years to come.



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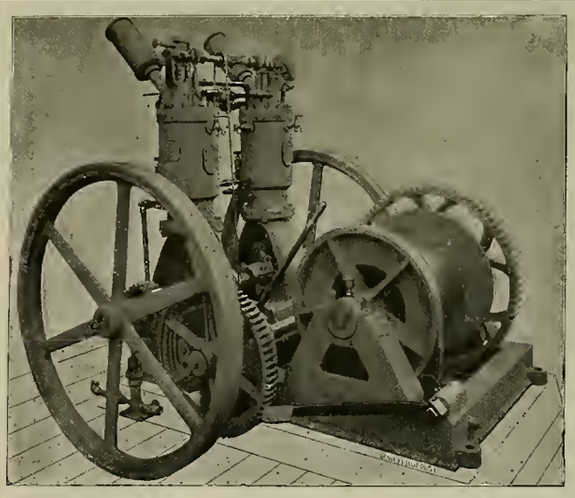
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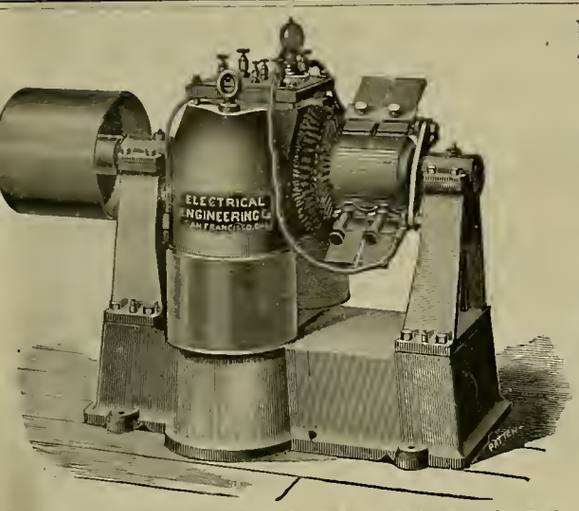
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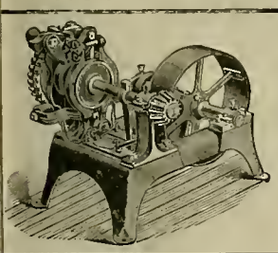
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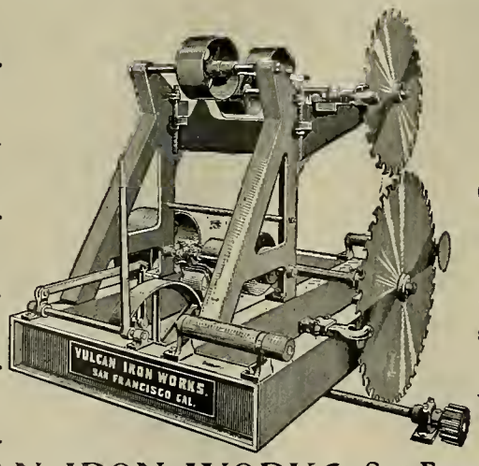
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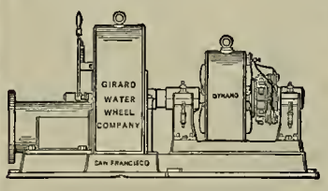
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ALBANY LUBRICATING COMPOUND

TWENTY-SEVEN YEARS' CONTINUOUS SERVICE in the great Mines, Steamships, Railroads and Mills all over the world prove it to be

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34-36 FREMONT ST., SAN FRANCISCO.
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DEALERS IN MACHINERY, OILS, MINING AND MILL SUPPLIES, ETC.

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TANKS

OF EVERY DESCRIPTION

FOR WATER WORKS, MINES AND MILLS

Large Water and Mining Tanks a Specialty.

Write us for descriptive catalogue and estimates on any kind of Tank Work.

PACIFIC TANK CO.,

City Offices, 33 Beale Street..... San Francisco, Cal.

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AMERICAN AND FOREIGN PATENT SOLICITORS

ESTABLISHED 1860.

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TAKE ELEVATOR No. 12 FRONT ST.

SAN FRANCISCO, CAL.

The McGlew Ore Concentrator Company.

TENTED SEPTEMBER 19, 1893. CHEAPEST, SIMPLEST, MOST DURABLE AND CLOSEST SAVING CONCENTRATOR IN USE. FRANK BARRERE, Secretary and Manager.

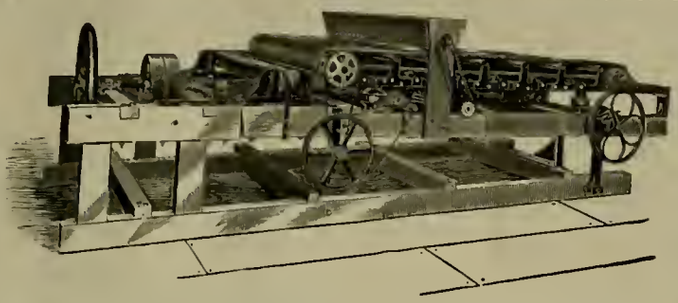
an be seen in operation at the Company's works, 132
in Street, San Francisco.

Office, 116 Davis Street.

NETY-FOUR AND ONE-HALF PER CENT
—SAVED—
ORES DIFFICULT TO CONCENTRATE.

MARVEL of Simplicity, Durability and Effectiveness
bining both Side and End Motion with a Bumping
PEED AND INCLINE of belt and amount of PER-
SSION easily and quickly regulated. WHILST IN
ERATION.
APACITY about ten tons. Only one-tenth horse power
uired. Adapted for either canvas or rubber belts.

ICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1893.
THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94¾ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully
E. L. BALLOU, Propr. Ballou Reduction Works.

The Edward P. Allis Company, Milwaukee, Wis.

Established 1860. Reliance Works.

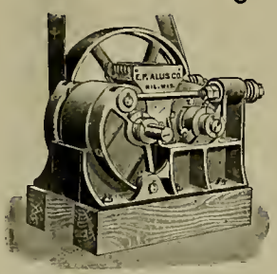
MINING, MILLING AND SMELTING MACHINERY.

Crushers, Rolls, Jigs, Concentrators, Screens, Stamps, Pumps, Compressors, Hoists, Boilers, Etc., Etc.

Reynolds Corliss Engines.

WORK THE BEST. PRICES THE LOWEST.

The Reliance Crushing Rolls.



The Best in the World.

BRANCH OFFICES:

San Francisco, Cal.	9 Fremont Street.
Butte, Mont.	30 W. Granite Street.
Salt Lake City, Utah	73 So. Main Street.
Denver, Col.	427 Seventeenth Street.
Minneapolis, Minn.	416 Corn Exchange.
Chicago, Ill.	509 Home Ins. Building.
Kansas City, Mo.	43 Armour Building.
Pittsburgh, Pa.	German National Bank Building.
New York City	26 Cortlandt Street.
City of Mexico	Calle Gante, No. 12.

WRITE FOR OUR NEW CATALOGUE.



NOTICE TO GOLD MINERS!

SILVER-PLATED AMALGAMATED PLATES
For Saving Gold

IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.
AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.

San Francisco Novelty and Plating Works
Incorporated.

SEND FOR CIRCULARS. 68, 70 and 72 First Street, San Francisco, Cal.

Justinian Caire, Agent
521 and 523 Market Street, San Francisco,
—DEALER IN—
Assayers' and Mining Material.
—MANUFACTURER OF—
BATTERY SCREENS AND WIRE CLOTH
—AGENT FOR—
Hoskins' Hydro-Carbon Assay Furnaces.

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Rock Drilling, Air Compressing, Mining and Quarrying
Machinery.
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BRANCH OFFICES:

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Apartado 830	City of Mexico

H. D. MORRIS & CO., Agents, 141 First St., San Francisco, Cal.

ADAMANTINE SHOES AND DIES
—AND—
CHROME CAST STEEL
Cams, Tappets, Bosses, Roll Shells and Crusher Plates.



STAMP SHOES.



STAMP DIES.

These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

Manufactured by CHROME STEEL WORKS, Brooklyn, N. Y.

H. D. MORRIS & CO., Agents, 141 and 143 First Street, San Francisco.

Special attention given to the purchase of Mine and Mill Supplies.

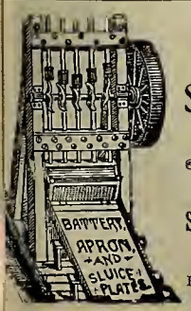


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141-143 First Street, San Francisco, Cal.

MANHATTAN RUBBER BELTING, PACKING AND HOSE,
SANDERSON DRILL STEEL,
MORRIS CENTRIFUGAL PUMPS,
LIGHT STEEL RAIL.



To Gold Miners!

Silver Plated Copper Amalgam Plates
For Saving Gold.

GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

SAN FRANCISCO GOLD, SILVER AND NICKEL PLATING WORKS,
653 and 655 Mission Street, San Francisco, Cal.
Telephone, Main 5931.
E. G. DENNISTON, - - - - - - - - - - Proprietor.
Every description of work plated. Send for Circular.

MINE BELL SIGNALS.

Adopted, Used and In Force in Accordance with State Law.

FOR THE CONVENIENCE OF OUR READERS IN THE MINING COUNTIES WE PRINT IN legal size, 12x36 inches, the Mine Bell Signals and Rules provided for in the Voorhies Act, passed by the State Legislature and approved March 8, 1893. The law is entitled "An Act to Establish a Uniform System of Mine Bell Signals to Be Used in All Mines Operated in the State of California, for the Protection of Miners." We furnish these Signals and Rules, printed on cloth so as to withstand dampness, for 50 cents a copy. MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

Market Reports.

The Markets.

SAN FRANCISCO, Sept. 12. 1895.

There was a little advance in silver during the week, a drop in lead, and a general holding of prevailing prices throughout, pig iron being promised another raise. Copper is king at present, the demand being something enormous. D. Houston & Co., of New York, report that the total exports of copper for the four years ending June 30, '95, aggregate 591,225,728 pounds fine, valued at $59,057,333, which is an average of about 9.98 cents per pound. The quantity of matte and ore included in these exports was about 25 per cent of the whole, 75 per cent being in the shape of ingots, bars, etc. England is the best foreign customer for American copper, taking during the four years 281,479,621 pounds, or 47.6 per cent of the total exports during that period, an amount equivalent to 78 per cent of the total United States production for the calendar year 1894.

During the last two years ending June 30, 1895, the exports of copper to Europe were 388,608,109 pounds, or 27,763,891 pounds more than the total production in this country for the year 1894. The foreign demand for American copper the past two years under review was so great as to absorb the entire production of this country for 13 months. English home consumption of copper during 1894 was at the rate of 3.43 pounds per head of population. For the 12 months ending June 30, 1894, English imports of American copper were equivalent to 2.55 pounds per head. With consumption of copper greatly increased in the United States it is evident this country will require a much larger percentage of its output for domestic purposes, thereby reducing the available surplus for export. The stock of American copper in England and France is down to 3199 tons, a decrease of 1101 tons since July 1, 1895. Imports of American copper into England from January 1 to August 15, 1895, were 7314 tons less than during the corresponding period of 1894.

The Calumet and Hecla made a large sale about the middle of August, currently estimated to amount to 10,000,000 to 15,000,000 pounds, at 12 cents.

The market for Copper closes firm at 12¼ cents for Lake, 11⅞ to 12 cents for Electrolytic, and 11¾ cents for Casting. Only a limited quantity of Lake Copper could be obtained at 12 ¼. The tendency of the market is toward higher figures.

New York Metal Market.

NEW YORK, Sept. 12.–PIG IRON—Southern, 11.50@14.50; Northern, 12@14.

COPPER — Brokers', 12.20 @ 12.25c; exchange, 12.15@12.20c.

LEAD—Brokers', $3.25; exchange, $3.40.

TIN—Straits, 14.40@14.55c.

SPELTER—Domestic, $4.15.

New York Silver Prices.

NEW YORK, Sept. 12.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.
Friday	30½	67	12 15	.....
Saturday	30⅝	67	12 25	3 25
Monday	30⅝	67	.....	3 25
Tuesday	30⅝	67⅛	.....	.....
Wednesday	30⅝	67	12 25	3 30
Thursday	30⅜	67⅛	.....	.....

The local bullion, money and exchange quotations curreut are as follows:

Commercial Loans, ⅝ per annum	.7@8
Commercial Loans, prime	.6@8
Call Loans, gilt edged	.7@8
Call Loans, mixed securities	.7@8
Mortgages, prime, taxes paid by lender	.6@8
New York Sight Draft	.2½c
New York Telegraphic Transfer	.5c
London Bankers' 60 days	.$4.89
London Merchauts	.$4.87½
London Sight Bankers	.$4.90
Refined Silver, per ounce	.67⅛c
Mexican Dollars, nominal	.54½c

San Francisco Metal Market.

COPPER.			
Bolt	¼ & 5-16, 19c; ⅜ and larger, 19c		
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	16	@	15
Sheet copper	—	@	20
ZINC.			
Sheet	9	@	
LEAD.			
Pig	—	@	4 00
Bar	—	@	4 10
Sheet	—	@	5 35
Pipe	—	@	4 85
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes "		"	1 45
Buck, Balls and Chilled, do. "		"	1 45
IRON.			
American Soft	15 00	@	17 00
Pig, per ton	16 00	@	19 00
STEEL.			
English, lb	15	@	17
ANTIMONY.			
Per lb	—	@	10
PIG TIN.			
Per lb	15	@	16 00
QUICKSILVER.			
Home trade, per flask	41 00	@	— —
TIN PLATE.			
Per bx	5 25	@	6 00
ZINC.			
Sheet	8¼	@	
BORAX.			
Refined, in car lots	—	@	5⅛
Refined, in sacks and barrels	—	@	5⅜
Powdered, in car lots	—	@	5⅜
Concentrated, "	—	@	4⅞
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 50
Greta			7 50
Nanaimo			7 00
Gilman			6 50
Seattle			7 00
Coos Bay			5 50
Cannel			8 50
Egg, hard			13 00
Wallsend			7 50
Scotch Splint			8 00
Brymbo			8 00
TO ARRIVE—CARGO LOTS.			
Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —
COKE.		75c	₱ bbl
Gas Companies'			
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —
NAILS.			
Wire			$2 50
Cut			2 25
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, Septemher 12, 1895.

No greater contrast could exist than the dullness of the local stock market, wherein are listed silver mines—among others, and the activity of the London Stock Exchange, which deals in dividend-paying gold mines—among others. Of course, here it is known that no connection exists between the morihund condition of the mining stock market and the status of the mining industry, hut the tenor of many letters received from other parts of this country as well as Europe, show that this fact is not generally understood. During the week, Sierra Nevada and the two leading Gold Hill stocks—Challenge Con. and Confidence—were huoyant, Union and Yellow Jacket also advancing. In the main, business was dull.

With all hills paid to date and exclusive of the present bullion run of the Morgan Mill, Con. Cal. and Va. reports $9,450 in its treasury.

The Apollo mine, Alaska, has received hullion valued at $95,000 since July 1st.

Specie shipments from this city from Jan. 1st to Sept. 1st, '95, aggregate as follows:

Silver bars	$5,538,248
Mexican dollars	3,574,201
S. American dollars	5,298
Gold coin	4,007,623
Silver coin	258,443
Gold dust	1,605
Currency and bonds	932,771
Total	$14,318,189

Consigned as follows:

Hongkong	$5,402,951
Shanghai	3,235,600
Japan	284,194
Central America	268,298
Honolulu	221,000
Mexico	4,850
New York	4,901,296
Total	$14,318,189

For the eight months of the year elapsed the receipts of quicksilver here were 19,445 flasks, as against 17,190 during the same time in 1894 and 16,025 in 1893. The exports during the same period were 9416 flasks as against 11,078 in 1894.

The following illustrates the changes of the week:

MINES.	Sept. 5	Sept. 12
Alpha	$ 16	$ 17
Alta Consolidated	12	11
Andes	33	34
Belcher	55	58
Best & Belcher	1 00	1 10
Bodie	12	14
Bullion	18	.....
Challenge	75	92
Chollar	60	61
Confidence	1 75	2 15
Consolidated California and Virginia	2 65	2 85
Consolidated New York	.....	.....
Crown Point	52	53
Exchequer	04	04
Gould & Curry	54	56
Hale & Norcross	1 70	1 70
Justice	.....	08
Mexican	67	72
Ophir	1 60	1 70
Overman	19	20
Potosi	58	63
Savage	40	40
Sierra Nevada	78	95
Union	57	64
Utah	.....	10
Yellow Jacket	42	45

San Francisco Stock Board Sales.

SAN FRANCISCO, Sept. 12, 1895.

9:30 A. M. SESSION.

100 Alpha Con	17	100 Mexican	71
100 Alta	11	300 Occidental	25
300 Andes	34	100 Ophir	1 60
100 Belcher	55	100	1 65
300 Best & Belcher	1 65	300 Overman	19
150 Bodie	14	200 Potosi	62
600 Challenge	92	700 Savage	38
400 Chollar	60	200 Sierra Nevada	93
100 C. C. & Va	2 70	100	94
150 Confidence	2 15	100 Union	63
400 Crown Point	53	100	64
200 Gould & Curry	56	100 Yellow Jacket	45
300 H & N	1 60		

SECOND SESSION—2:30 P. M.

300 Ophir	1 70	100 Alpha	17
50	1 65	50 Confidence	2 15
200 Mexican	72	550 Sierra Nevada	95
550 G. & C.	56	300 Utah	10
200 Best & Belcher	1 10	500 Exchequer	04
300 Con Cal & Va	2 80	400 S B & M	10
20	2 85	200 Overman	20
500 Savage	40	800 Justice	08
50 Potosi	62	100 Union	63
50	63	100	64
500 Chollar	61	400 Challenge	88
300 Hale & Norcross	1 70	200 Occidental	26
600 Yellow Jacket	45	400 Andes	36
2100 Con. Imperial	04	250 Bodie	14
200 Kentuck	15		

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Bodie Con M Co, Cal	18	15c	Aug 13, Sep 16, Oct 7	M E Willis, 309 Montgomery
Con Imperial, Nev	36	1c	Aug 5, Sept 12, Oct 3	C L McCoy, Mills Building
Evening Star M Co, Cal	19	1c	Aug 5, Sept 10, Sept 22	J J Scoville, 320 Sansome
Kentuck Con, Nev	11	10c	Aug 6, Sept 10, Oct 1	Aug Waterman, 309 Montgomery
Sierra Nevada S M Co, Nev	109	25c	July 30, Aug 30, Sept 23	E L Parker, 309 Montgomery

Assessment Notices.

FAIRFAX VILLA COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Fairfax, Marin County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of August, 1895, an assessment, No. 4, of Fifty Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 56, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of September, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 21st day of October, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, Room No. 56, No. 309 Montgomery street, San Francisco, California.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 23d day of August, 1895, an assessment, No. 3, of 2½ cents per share was levied upon the whole of the capital stock of the corporation, both paid and unpaid, payable immediately in United States gold coin to the Secretary, at the office of the company, 213 Jackson Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of October, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 28th day of October, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

WANTED!

A PRACTICAL PLACER MINER,

Capable of taking charge of hydraulic plant.

Address, stating salary expected, TEMPLE BAR, Kingman, Arizona.

Hydraulic Mine for Sale.

Not on a navigable stream; in northern California. Good dump; no trouble with tailings; 180 acres of mining ground; 5000 inches of water. Can work eight months in the year. Ample opportunity given a buyer to fully test the property before payment is made. For further details,

Address X, 2022 W St., Sacramento, Cal.

TUBBS CORDAGE CO.

(A CORPORATION.)

Constantly on hand a full assortment of Manila Rope, Sisal Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc. Extra sizes and lengths made to order on short notice

611 and 613 FRONT ST., San Francisco, Cal.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald, Trustee	295	1,000	100 00
M. J. McDonald, Trustee	296	1,000	100 00
M. J. McDonald, Trustee	298	1,000	100 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	457	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
Mrs. Hattie C. Baggs	529	201	20 10
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4,000	400 00
Montgomery Baggs	528	100	10 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

Hoskins' Patent Hydro-Carbon Blow-Pipe and Assay Furnaces.



No dust. No ashes. Cheap, effective, economical, portable and automatic.

SEND FOR PRICE LIST TO

W. HOSKINS, 81 South Clark St., Room 51, CHICAGO, ILL.

RUPTURE CURED!

NO DANGER. NO OPERATION. NO PAIN.

No Detention from Business.

QUICKLY! PERFECTLY! PERMANENTLY!

NO PAY UNTIL CURED.

J. C. ANTHONY, M. D.,

San Francisco Offices, Suite 86 and 87, Chronicle Building.

P. & B. INSULATING TAPE. ARMATURE VARNISH. ELECTRICAL COMPOUND.

STANDARD OF EXCELLENCE—USED IN ALL FIRST-CLASS ELECTRICAL WORK.

Samples and Circulars on application.

PARAFFINE PAINT CO. 116 BATTERY STREET, SAN FRANCISCO. 221 SOUTH BROADWAY, LOS ANGELES.

Sole Manufacturers of P. & B. Paints, Roofing, Building Papers.

A REVOLUTION IN ORE PULVERIZING.

THE

Merralls Hydraulic Quartz Mill,

The Greatest Ore and Rock Pulverizer in the World, Either Wet or Dry.

THE ONLY MILL BUILT THAT RIVALS STAMPS. Our six-foot mill (No. 1) will reduce more ore or rock to pulp than a ten-stamp mill, with less than one-half the power and less than one-half the wear and tear, besides saving a much larger per cent of the gold in the ore.

This mill will reduce from 25 to 500 per cent more ore than any other rotary mill in use. Cheap, simple and economical. Four sizes built—from 15 to 250 tons capacity.

Send for Circular. Address

MERRALLS MILL COMPANY,

Room 12, Third Floor, Mills Building..... San Francisco, Cal.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPTEMBER 3, 1895

545,491.—STEAM COOKER—J. B. Brown, Salem, Or.
545,643.—FIRE LADDER—A. B. Cairnes, San Diego, Cal.
545,818.—VOTING MACHINE—H. A. Clifford, S. F.
545,645.—CAR COUPLING—Rebecca M. Ford, Oakland, Cal.
545,699.—TARGET—O. Kauffmann, Sacramento, Cal.
545,650.—HOSE NOZZLE—F. Lewis, Pleasanton, Cal.
545,900.—POLE LIFTER—C. L. Nelson, Kirkland, Wash.
545,730.—CAR AXLE BOX—J. Perlthomme, Oakland, Cal.
545,725.—GAS REGULATOR—J. L. Richter, Alameda, Cal.
545,614.—SOAP SHEETS—Roach & Tourville, Sentle, Wash.
545,715.—STEAM COOKER—A. Stewart, S. F.
545,557.—CURLING-IRON HOLDER—G. A. Turner, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast Inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

PRESS FOR PACKING FRUIT.—Antony C. Donotovich and James Porteous, Fresno, Cal., said Donotovich assignor to said Porteous. No. 544,866. Dated Aug. 20, 1895. This invention relates to means for packing fruit into boxes in such a manner that it shall lie therein in separate packages or parcels, whereby any one or more of said packages may be removed from the box without difficulty. The press consists of a compartment mold to receive the fruit, an underlying platform to support and hold the box up to the mold, a means for regulating the height of the platform and holding it where regulated, and a plunger adapted to enter the compartment mold and force the fruit therefrom into the underlying box. There is also a supply mold in which the operatives place the fruit, each in his own mold until all the compartments are full. The operative then delivers the supply mold upon a temporary base to the operator of the machine who places the supply mold directly over the receiving compartment mold in the machine, then withdrawing the temporary base of the supply mold he brings down the plunger and presses the fruit out of the compartments of the supply mold into the compartments of the main mold and down therein into the underlying box which at this time is pressed up by the platform close up under the main molds and forms a bottom therefor. This operation is repeated successively until all the fruit is pressed through the two molds into the box which, as it is filled with successive layers, is gradually lowered, and as many layers are pressed into the box as are necessary to complete the packages or parcels, and these lie separately and independently in the box and are pressed closely together, though readily separable.

FRUIT CRATE.—Charles S. Chamberlain, Oakland, Cal. No. 544,881. Dated Aug. 20, 1895. This invention relates to improvements in boxes or crates for the transportation of fruit in such a manner that the fruit will be perfectly ventilated and will not be bruised by any handling the crate may undergo. The crate consists of top and bottom boards with sides composed of vertical strips having transverse triangular strips fixed across their ends to connect them together and at a distance from the ends sufficient to form a space to admit the top and bottom boards of the box which are nailed thereto; wire gauze screen material having a top and bottom nailed to the transverse triangular strips, and the sides extending beneath and nailed to the vertical side strips, together with a series of trays consisting of open center frames, the inner walls of the trays being beveled to present an inclined surface to the fruit, the trays being laid successively into the exterior case with sufficient space for a layer of fruit in each tray.

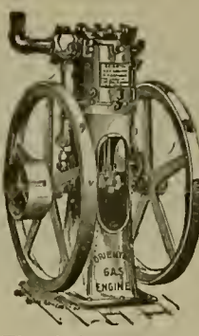
HORSE BREAKING APPARATUS.—John W. Green, Cotati, Cal. No. 545,228. Dated Aug. 27, 1895. This invention relates to an apparatus which is designed for the purpose of breaking and taming horses and correcting bad habits. It consists of three bands connected with the front legs of the horse, ropes leading from the hands and connecting with the head-stall, a rope secured around the upper jaw having a knot or protuberance pressing over the front of the nose, guides through which the rope is led over the top of the head and the hips of the horse to a point of attachment upon the wagon, whereby the horse is obliged to move his legs by the movement of a vehicle and is prevented from kicking.

STREET CAR BRAKES.—Henry T. Atkinson of Oakland, Cal., assignor of five-twelfths to J. E. Morris of same place. No. 545,217. Dated Aug. 27, 1895. This invention relates to a device which is especially applicable to brakes to be used upon street cars. It consists of a flexible chain connected with the brake-rod, a direction pulley around which it passes, a cam fulcrumed in a standard upon the car, around which the chain passes, a lever with which the cam is adjustably connected, said lever being movable to draw the chain up with a gradually decreasing motion and increasing power and to release it by reverse movement. It also consists in a pawl and ratchet mechanism for raising or lowering the post to adjust it for elongation of the chain, and in mechanism for readily altering the relative position of the cam and actuating lever.

CAR COUPLING.—Rebecca M. Ford, Oakland, Cal. No. 545,645. Dated Sept. 3, 1895. This invention has for its object to provide a device by which cars are automatically coupled when they come together, and a means for withdrawing the pin and releasing the coupling from either side without passing between the cars. It consists of a draw-bar and bumper, a spring-actuated sliding block movable in the chamber within the draw-bar and normally held in line beneath the pin opening so that the pin is prevented from falling through the draw-bar; inclined levers fulcrumed at their central points upon the ends of the car above and to each side of the line of the pin, a link occupying the space between the separated inner ends of the levers and pivotally connected therewith; a chain connecting a coupling pin with the link, and connections with the outer ends of the levers whereby the coupling pin may be withdrawn by an operation upon either side of the car.

EXTENSION FIRE LADDER AND TRUCK.—Alexander B. Cairnes, San Diego, Cal. No. 545,643. Dated Sept. 3, 1895. This invention relates to improvements in extension ladders and the trucks upon which they are usually conveyed, the whole device pertaining to apparatus employed by fire departments. The object of the invention is to provide a ladder capable of being raised to any desired angle between the horizontal and perpendicular, and which may be extended to any practicable distance by means of two or more supplemental ladders slidable upon the lowermost one; a mechanism by which they are raised, extended and turned about to reach any point with relation to the original position of the truck without changing the ladder, and a means for steadying and bracing the ladders after they have been raised and turned to the desired position.

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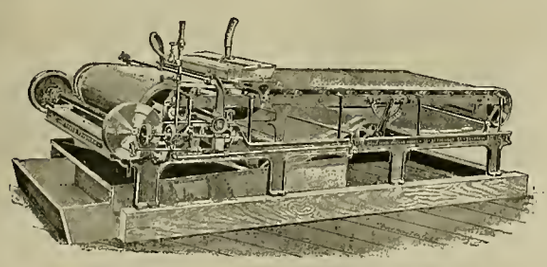
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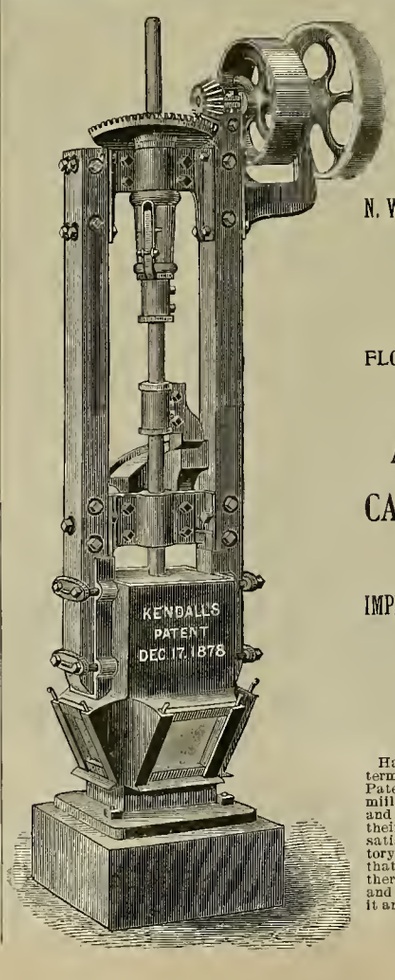


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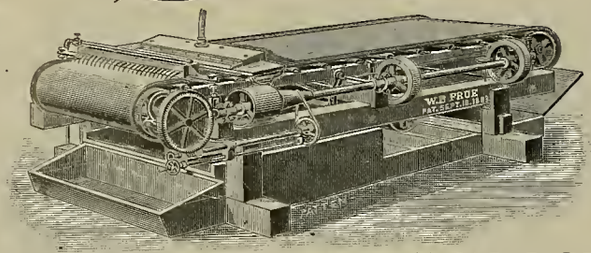
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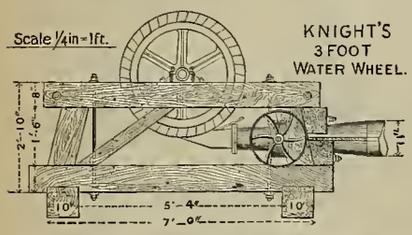
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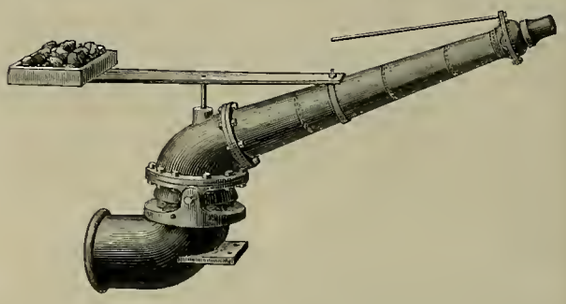
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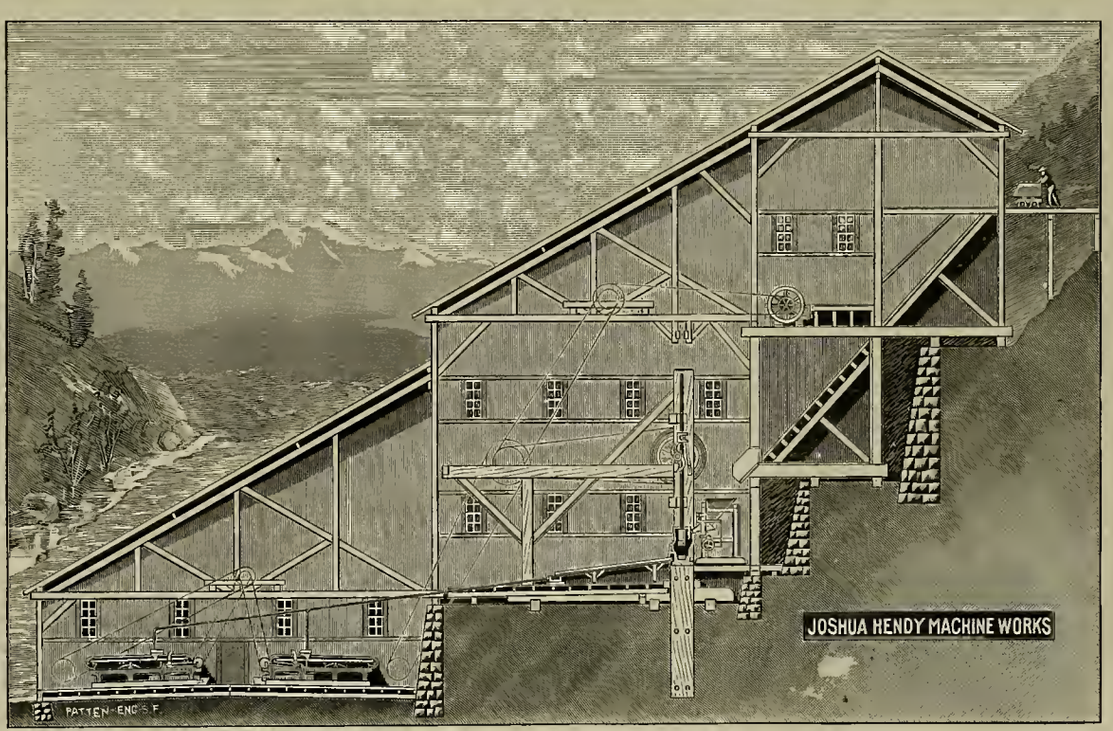
VOLUME LXXI. Number 12. SAN FRANCISCO, SATURDAY, SEPTEMBER 21, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

A Modern California Stamp Mill.

The accompanying illustration pictures a modern California quartz mill of twenty stamps, as built at the Havilah or old Hendy mine at Nashville, on the Cosumnes river, in El Dorado Co., Cal. The general arrangement of machinery, from the grizzly through rock breaker, ore bins, Challenge feeders, stamps, etc., is the standard California style. The stamps, weighing 1100 pounds each, are of the heavy type, intended for a fast and low drop. The stems are of refined iron, 3½ inches in diameter by 15 feet long. Shoes, dies, cams and tappets are made of steel, and the cams are so constructed that a very quick drop can be obtained without "strikiug." It bas long been known that there is economy in a fast drop and this has been fully demonstrated in this case. Tbe stamps in this mill are dropping 107 times per minute and the capacity is within a fraction of four tons per stamp per 24 hours, discharging tbrough a 40-mesh screen. The fast drop produces a very lively splash in the mortar, which is the cause of the high capacity. The mortars, weighing 6000 pounds each, have very large screen surfaces, the length of the screen being the full lengtb of the mortar, without any obstructions at the ends, as the lugs for the keys are brought out beyond the end walls. The mortars have inside electroplated copper plates, made of $\frac{3}{16}$-inch-thick copper, plated with three ounces of silver to the square foot. Tbe outside amalgamating tables have for each five stamps a five-foot wide by twelve-foot long plate, made of five-pound copper, plated with two ounces of silver per square foot. From tbe copper plates the pulp flows through iron pipes ou to six 5-feet wide Improved Triumph concentrators. Each of these concentrators handles in tbis case from 12 to 13 tons of pulp per 24 hours. In grading tbe millsite about 1200 cubic yards were removed, 25 per cent of wbich bad to be blasted. About 400 percb of retaining walls were built, making the ground perfectly solid. The battery frames, of the knee type, are huilt of heavy timber, and the ore bins likewise are suhstantial and intended to stay. The mill-building frame is of the skeleton type, covered with boards and battens. The entire plant was ready to run in forty days after the date of order—machinery manufactured, shipped to El Dorado, bauled fourteen miles to Nashville, millsite graded, lumber furnisbed and framed, mill building put up, and all machinery, including two steam engines, one for stamps and one for concentrators, erected ready to run. The entire plant was contracted for hy the Joshua Hendy Machiue Works of this city hy their engineer, John O. Norbom, who tben bad just finished tbe 40-stamp mill at Plymouth, in Amador Co., Cal. This mill was manufactured and erected in tbe remarkably short time of 45 days.



A DEL NORTE COUNTY HYDRAULIC MINE.



MODERN CALIFORNIA TWENTY-STAMP MILL.

Hydraulic Mine in Del Norte County.

Herewith is a picture of the R. W. Miller hydraulic mine, on Smith river, Del Norte Co., eight miles from Crescent City, which was worked for the first time last winter with good results. This miue at the present time enjoys the distinction of heing the only mine equipped for hydraulic mining in Del Norte county. The claim consists of forty acres of gravel, which it is thought will prove a paying property. In the near vieinity are several other bars which, with the outlay of a small amount of capital, could he made to pay handsomely. The cut is furnished by Mr. J. E. Eldredge, who engraved it from a photo taken by J. J. Owings.

Much is being at present said regarding tbe great eagerness shown by the people of London and Paris for shares in Rand, South African mines; but the craze is not so surprising. The fact that some of the mines in that region produce so prodigiously that the June output of gold aggregated $4,000,000 is sufficiently dazzling to draw unwary iuvestors into schemes of doubtful value. It is the opportunity of the era for unscrupulous men to create and unload worthless stock schemes, the genuine being so easy to counterfeit aud pass before the victims discover their mistake, and the game is being worked for all it is worth. That the inevitable crash will injure legitimate mining the world over is manifest, but such injury will be but temporary. In this regard an article on page 185 is of iuterest.

Some of our Eastern cousins evidently have little idea of the vast extent of the metal mining industry of this region, which in '94 produced $40,000,000 iu gold, $47,000,000 in silver, $30,000,000 in copper and $15,000,000 in lead. The five greatest transcontinental railroad systems in the country together produced no such business result as this. They paid no such wages, made uo such profits, and did not add to the nation's wealth as the mining industry bas done. The mining industry, too, adds this to the permanent wealth of the nation in a degree unapproached by the product of any otber industry.

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J. F. HALLORAN.....General Manager

San Francisco, September 21, 1895.

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The Mineral Land Committee and the Corporations.

At the November, '94, meeting of the California State Miners' Association the manifest intention of the railway corporations in this State to unjustly and illegally absorb and secure title to a large part of the unpatented mineral area of the State caused a general discussion of the matter, which resulted in the unanimous conclusion on the part of the 507 delegates that immediate action was necessary. To take such required action a "committee on the protection of mineral lands" was appointed. It immediately organized and has energetically and successfully carried on proceedings that resulted last June in checking the process of wholesale absorption that had been begun. Recognizing this, the railway corporations made overtures of compromise, which were heard and intimation given that if the terms of such proposed arbitration were put in writing the communication would receive due consideration from the committee.

Accordingly the S. P. & C. P. Co.'s, under date of Aug. 20, '95, made a proposition to the committee acting on behalf of the association, which was given considerable attention, the unanimous judgment of the members of the committee being that the provisions and requirements of the proposition were so one-sided and unfair, so subversive of all that the committee had worked for and secured, and so contrary to the interests of the association creating the committee, that without considerable modification, amounting, virtually, to a new form of agreement, the proposition could not be seriously entertained.

After much thought and conference an answer to the proposition was drafted, and on the 17th inst., after unanimous endorsement by the committee's members, was sent.

The full official text of the answer is as follows:

SAN FRANCISCO, CAL., Sept. 17, 1895.

W. H. Mills, Esq., Offices Southern Pacific Company, San Francisco, Cal.—DEAR SIR: The California Miners' Association's committee for the protection of mineral lands respectfully advise you that the proposition contained in your letter under date of 20th ult., addressed to John M. Wright, Esq., representing this committee, has been duly considered by said committee, and said committee unanimously accepts your said proposition, provided it be modified by the incorporation of the following provisions:

First—Upon the one part, the party to the proposed agreement shall be the California Miners' Association, and you are advised that said association acts in the premises by this, its "committee for the protection of mineral lands."

Upon the other part, the parties shall be the following-named railroad companies, owning or controlling what are known as "Congressional grants" of land situate within the State of California, such grants being, as defined by the statutes creating them, respectively, to wit: The Southern Pacific Company, the Central Pacific Railroad Company, the Western Pacific Railroad Company, the California and Oregon Railroad Company, and the Southern Pacific Railroad Company.

Second—The proposed agreement shall apply to all the unpatented, odd-numbered sections within the limits of the land grants and indemnity land grants of said railroad companies within the State of California, and not merely to lands lying within six miles of any mineral entry, claim or location.

Third—The proposed agreement shall apply only to those protests and contests against the patenting of said lands which have heretofore been made or instituted and those which might hereafter be made or instituted by or under the auspices of the California Miners' Association as such, and shall not be held or understood to include or apply to any contest between said railroad companies or any of them and any individual claimant of land.

Fourth—The two commissioners to be selected under the proposed agreement—the one by the railroad companies and the other by the California Miners' Association—shall be appointed within thirty days from and after the concurrence of the parties in the proposed agreement and shall examine and report upon the character of said unpatented odd-numbered sections of land, by sections where the lands have been surveyed, unless there are such differences in the situation or character of different parts of the same section as, in the opinion of said commissioners, to require its classification by subdivisions, in which case the examination and classification of every such section shall be by twenty-acre subdivisions. If the lands examined are not surveyed classification shall be made by tracts of such extent and designated by such natural or artificial boundaries to identify them as said commissioners may determine.

In all cases where said commissioners shall agree as to the character of any of the lands embraced within any list of selections submitted to them for examination their decision shall be final; but in every case where they shall disagree as to the character of the lands within any such list, they shall have power and it shall be their duty to appoint a third commissioner to act with them, but only in deciding upon the character of those lands within any such list the character of which shall be so in dispute, and when the character of such disputed lands within any one list or selection shall have been decided, thereupon immediately the powers and employment of such third commissioner shall cease. In all such cases where three commissioners shall act the decision of any two of them shall be final.

Fifth—The proposed agreement shall provide: That said commissioners shall classify and report as mineral lands all lands which, prior to their examination by said commissioners, shall have been located or patented as mineral lands or which have, or probably will have, a market value by reason of the mineral which they contain, or which show such indications of deposits of valuable minerals as would induce a miner to spend his time or money upon them, with the reasonable expectation of finding mineral in paying quantities, or which, from their geological formation or location in a well-defined mineral belt, or their situation or property in equity, or relation to known mineral lands, are, or probably will be, valuable for the mineral therein; and that all these matters shall be considered by said commissioners in determining the mineral or non-mineral character of such lands and in classifying the same; and that where mining locations shall have been made or patents issued for mining ground in any section of land before its examination by said commissioners such location or patent shall be taken as prima facie evidence that the forty-acre subdivision within which such location or patented ground is situate, is mineral land; provided, said commissioners shall not consider the word "mineral" as including iron or coal; and provided further, that said commissioners shall examine and classify said lands without reference or regard to any previous examination or report or classification thereof.

Sixth—Within a certain time after the coming in of each report of said commissioners (which time shall hereafter be fixed by rule) a relinquishment or abandonment shall be filed in the proper land office by the railroad company affected by such report of all the lands designated in such report as mineral lands, and such relinquishment or abandonment shall be final and irrevocable.

Seventh—It shall be stipulated that no further action shall be had or taken in or by the Land Department of the United States or by any of its officers on any protest or other proceeding heretofore commenced by the California Miners' Association or under its auspices against the patenting of any of said lands, and that no further action shall be had or taken toward the patenting of any of the lands affected by any such protest or proceeding until after such commission shall have examined and reported upon the lands affected by such protest or proceeding, and the railroad company affected by such report shall have filed in the proper land office its relinquishment or abandonment of the lands classified in such report as mineral lands; provided, however, that any such protest or proceeding shall forthwith be withdrawn upon the withdrawal of the railroad company affected by such protest or proceeding of the list of lands to which such protest or proceeding relates and the filing in the proper land office by such railroad company of a sufficient stipulation or other guaranty that such list shall not again be filed, and that no other and further action shall be had or taken toward the patenting of any of the lands included in such lists until after such commission shall have examined and reported upon the lands inclued in such list, and the railroad company affected by such report shall have filed in the proper land office its relinquishment or abandonment of the lands classified in such report as mineral lands.

Eighth—And it shall be further stipulated that upon the filing of the relinquishments or abandonments above provided for all protests and proceedings affecting the lists embracing the lands so relinquished or abandoned which have heretofore been, or which may hereafter, pending these negotiations, be made or instituted by or under the auspices of the California Miners' Association, shall be dismissed, and thereafter no other and further protest or proceeding shall be made or instituted by or on behalf of said association or under its auspices, obstructing or intending to obstruct the patenting of any of the land embraced in any such list and reported by said commissioners as non-mineral lands.

Ninth—No list of selections shall hereafter be filed in any of the United States land offices in this State by said railroad companies or any of them until such commissioners shall have examined and reported upon the lands embraced in such list.

Tenth—Either side to the agreement may at will discharge or remove any commissioner that may have been appointed by it, and shall appoint another commissioner in the place of the one so discharged or removed, provided that no such discharge or removal shall take effect pending examination and report by such commissioners upon any list of selections submitted to them for examination and classification, the time within which such examination shall be made and such report submitted to be hereafter fixed by rule. The discharge or removal of either of the first two commissioners shall operate to remove the third commissioner, if any he then acting, but such third commissioner may be again appointed in the manner above provided.

Eleventh—Each side to the proposed agreement shall defray the compensation and expenses of the commissioner appointed by it, and in all cases where a third commissioner shall be employed his compensation and expenses shall be paid jointly by the two sides.

Twelfth—The proposed agreement shall be operative until Congress shall have passed some law providing for the classification of said lands.

The views above expressed are concurred in by Hon. J. H. Neff, president of the California Miners' Association, specially acting as a member of this committee by the request of executive committee of said association.

Should the foregoing provisions be acceptable to you, this committee will be pleased to join you in formulating a set of rules for the government of the parties and of said commissioners in carrying out the proposed agreement; and in this connection this committee submits that the provisions of the act of Congress, entitled "An act to provide for the examination and classification of certain mineral lands in the States of Montana and Idaho," approved February 26, 1895, and the rules promulgated by the Land Department for the purpose of carrying such act into effect, should, as far as they may be applicable, furnish the basis for a system of rules that shall be established for carrying the proposed agreement into effect.

Very respectfully,

A. H. RICKETTS, Chairman.
JOHN M. WRIGHT.
CHARLES T. YALE.
C. E. HOFFMAN.
E. C. LOFTUS.

Committee of the California Miners' Association on the Protection of Mineral Lands.

The proposition is fair, specific and exact; it is true to the interests of the association and just as regards the claims of the corporation.

The above is given place here purely as a matter of record, for in future years all these matters will come up for final rehearing. It is not probable, barely possible, that the proposition of the committee will receive affirmative reply. That Mr. Mills will reply is certain; that his reply will be worthy of him and fully sustain the reputation he bears of being a skillful writer is equally certain. But it is not at all probable that anything will come of this correspondence that can result in compromise or arbitration. The facts themselves, the nature of the case, and all attendant circumstances and surroundings are against such result, however desirable it may seem to be.

Regarding the coming miners' convention in this city on the 14th of next month, it is in order to say that the mineral lands committee will occupy the most important place in the transactions of this convention of the California Miners' Association. The assertion has been made that it occupies too prominent a part; that its work is unnecessary, for the railroad company will do better in this regard for the miners than they can do for themselves; that the association has strayed away from its original proposition looking to the rehabilitation of hydraulic mining and is busying itself with matters beyond its original province or purpose. Whatever the committees of the association should or should not do regarding other things, this much is certain: that at the last convention in November '94 it was the topic of general discussion in and out of the convention that the corporations were trying to absorb the unpatented mineral area of the State, and after full and free debate and in clear understanding of the matter it was then decided that a committee be appointed, not to "fight" the railroad or anything else, but to protect the mineral lands of the commonwealth to its citizens and put a stop to illegal acquirement of those lands on the part of any one. Just what this committee has done is a matter of history. It has succeeded in checking such illegal acquirement on the part of the corporation: by intelligent effort it has done just what it was delegated to do: it has succeeded in the accomplishment of the purpose for which in good faith it was created, and now, because of that very success, some of those who created it or acquiesced in its creation seek to destroy its work, nullify its influence and undo all its service to the State and to the association. Such action is unworthy honorable men. In those things private gain or personal feeling or disappointed expectations should give way to the public good, to the best interests of the association and the State.

Corporate influence is trying to make itself felt in the councils of the association and is seeking insidiously to subvert and destroy what it could not otherwise overcome. It is asserted that an effort is now making in certain counties to secure a sufficient number of delegates to do the work of the railroad; that the C. P. & S. P., recognizing the successful antagonism of the mineral land committee, has silenced or made passive some of the State press susceptible of being so influenced, and that sufficient representation is to be secured in the convention to deal a death blow to the committee and its work, and that, too, by the hands that should uphold it and carry on the work so ably begun.

Had the committee on mineral lands been content to perfunctorily perform a few preliminary duties, and then relapse into harmless quiescence, it would not have been assailed; it has, however, been too industrious, its members have followed out their instructions too faithfully and intelligently, and the result has been so annoying to the corporations which had planned to acquire so much of the State's

unpatented mineral area that the committee has ome under corporate displeasure, a fact which hould commend it to the miners and the public gen-rally, instead of being cited as the reason for its essation or discontinuance.

It is an exemplification of the old fable of the bundle of sticks. With singleness of purpose and unity of effort the miners of this State have done much, and can do more. If they allow themselves o be hoodwinked by corporate influence and allow railroad representation to dictate their actions and direct their policy, they cannot complain if they find out, too late, that they have been betrayed, and that the corporation they successfully opposed and almost brought to terms that would insure public justice had succeeded in the convention of '95 in checkmating their efforts by subtle schemes of division and debate, and introducing discord where harmony and unity of purpose alone should exist.

That it is deemed necessary to say this is unfortunate, but it is always best to be frank in those matters, and it is believed that in this case the best action for the different county mining associations to pursue is to send as delegates men known to wear no corporation straps nor collars; men who understand the situation and with courage enough to stand by the right.

From best obtainable sources it is estimated that twenty-one dividend-paying incorporated mines paid $1,342,680 in the month of August, and that fifty-eight incorporated mines paid $7,102,800 dividends during the first eight months of '95. These amounts by no means include anything like the aggregate of dividends paid by mines in this country. Several times this journal has essayed to furnish an approximately correct list of dividend-paying mines, but it has been found impossible to make and keep it all-embracing and correct. Many of the most profitable mines—particularly in this State—are private, unincorporated business concerns, and, of course, as disinclined to furnish information regarding their private business as any other business enterprise. Hence the impossibility of furnishing exact or correct data under this head. It is to be said in this regard that while dividends are justly indicative of profit, yet, unusually "declaring a dividend" in an incorporated company is not always a guarantee of present or permanent prosperity. It would be better, especially in this State, if more publicity were given the gold output. In Colorado, South Africa, and elsewhere great effort is made to publish the gold output, dividends declared, etc., as a splendid advertisement. Here in California we take it for granted that everybody knows that this State is in every way the best gold-producing region in point of accessibility, advancement in mining methods, comfort of living, quantity and quality of gold-producing area, etc., forgetting that a large part of the world's inhabitants, and even a very large percentage of United States dwellers have a misty idea that California is one of the has-beens and that this State is no longer a gold-producing region. Our mutual interests—consumers, gold producers, manufacturers, and all—would be better conserved by a wider diffusion of facts in this regard.

Concentrates.

The Morning Star gravel mine has declared dividend No. 57 of $4 per share.

The August payroll of the Anaconda, Montana, smelters aggregated $250,000.

The Nevada Reduction Co. has incorporated at Elko, Nev.; capital stock, $30,000.

The Angels *Voice*, of Calaveras Co., is told that the Tulloch mine has been sold to New York men for $40,000.

W. H. Blaisdel, of Yuma, Arizona, is reported to have bought the Worrington mine, Havilah, Kern Co.

Husted & Goff have sold their Husted mine, Hassayampa district, Arizona, to Basford & Keating for $15,000.

The Black Oak mine, sixteen miles from Auburn, Placer county, is reported sold to a French syndicate for $75,000.

There will be a creditable mineral exhibit at the Oregon Industrial Exposition, which opens at Portland on October 5th.

The Merced G. M. Co.'s stock is quoted in Boston at $43 on sales. There are 300,000 shares, which seems reasonably dear.

The Pioche, Nev., *Record* says all of the aluminum coins issued by the DeLamar Company are being replaced by silver coins.

The California Miners' Association will hold its annual convention in this city on the 14th of next month. The several county miners' associations are entitled to representation therein on the basis of one delegate for each ten members of each association.

The English Mountain mine, in which O. O. Howard is interested, near Graniteville, Nevada Co., is reported closed down.

According to a Trinity county paper a seven days' run at the Altoona quicksilver mine resulted in "420 flasks of quicksilver."

Indications are that the Harmony drift mine at Nevada City will soon be on the list of California dividend-paying gold mines.

Robert McMurray has bought the Tip Top gravel claim, Nevada Co., and the adjoining West Harmony works and machinery.

The new mining company at Globe, Arizona, incidentally announce that they are not in the merchandise business and will keep no store.

The Calamet and Hecla Mining Co., which has already paid $1,000,000 in dividends this year, will pay a third $500,000 dividend on the 18th of next month.

The Miners' Union picnic held two weeks ago at Anaconda netted $935.30, which will be forwarded to the miners of the Coeur d'Alenes who are now on strike.

The Vallejo Quicksilver Mining Company has been incorporated at Fairfield, Solano Co., to mine quicksilver in Napa Co. Capital stock, $100,000; amount subscribed, $23,000.

The Mount Pleasant Mining Company of California has incorporated here: C. F. Kinsman, W. A. Boole, J. W. Butler, E. R. Smith, J. W. Farren, S. P. Lunt, W. H. H. Hart; capital stock $1,000,000.

The *New Northwest* predicts that Montana will produce $4,000,000 in gold this year and about 13,000,000 ounces of silver, of which latter metal one-half will come from copper ores, the same as last year.

W. B. McCabe, formerly a California miner, now employed in the Anaconda mine at Butte, Mont., has fallen heir to $250,000 by the death of W. P. Dolan, who some years ago adopted him as his son.

The regular weekly sale of the Anaconda copper mine is reported, this time to "an Anglo-American syndicate" represented by Kahn, Loeb & Co. of New York, and the Rothschild Exploration Co. of England.

The Redding *Free Press* has begun a daily edition, which it says is justified by the increase in business there incident to the extensive mining developments now going on near Redding, notably the operations of the Iron Mountain Co.

Of Butte's two teams of rock drillers, Burns and Campbell drilled 36 9-16 inches in the tournament at Victor, Col., and captured the first prize of $600. Freethey and Tallon won the first prize of $500 at Cripple Creek, with 35 15-16 inches.

The Phœnix *Herald* claims that "Arizona puts out more copper value to-day from her great copper mines at Bisbee, Clifton, Globe and Jerome than all other sections of the United States." The Butte, Montana, papers are still to hear from.

Good reports come from the property of the Boulder Mining Co., in San Bernardino Co., thirty-five miles southeast of Salton. The company has six claims, on which eight shafts have been sunk and four tunnels run, $20 ore being reported in considerable quantity.

The July gold output of the Rand district, South Africa, is reported to be 199,453 ounces, 1488 less than that of June, but greatly in excess of the July, '94, output, which was 167,953. The augmentation is still further illustrated by comparison with the output for July, '93, which was 126,169 ounces.

Geo. W. Starr is now consulting engineer for Barnato Bros., South Africa, at a salary of $35,000 per annum. C. S. Richardson and E. R. Ahadie, two Nevada county miners, are superintending mines under control of the Barnatos, the former being in charge of the Lydenburg property and the latter of the Buffelsdorn.

On account of the uncertainty of the boundary line between Riverside and San Bernardino counties, owners of mining claims on the borders of these counties are confused in recording the locations of their claims. The supervisors of those counties owe it to the miners to have definite maps and records made to obviate such confusion.

Items appear now and then regarding discoveries here and there of clay deposits "carrying 35 per cent aluminum," and buoyant theories evolved therefrom. It is probable alumina is meant. A good deal of clay contains about that percentage of alumina, but as alumina contains ordinarily about 6 per cent of aluminum, it is evident that the distinctive difference is worth noting.

It is necessary, says the *Tidings*, to remove the old Wyoming dump in building the new forty-stamp mill at that mine, near Nevada City, and the men thought that powder would be the most effective way. A drift was run under the dump, and on Saturday about 1000 pounds of black powder were used to blow it up. It worked to perfection and loosened up the big dump and scattered it for hundreds of feet.

The Nevada *Transcript* tells of a mine in that vicinity that remained unworked for several years, and upon which operations have recently been resumed, which is looking so well now that the owners are said to have declined an offer of $25,000. This is another instance of where a mine that has failed to pay under one management has been taken hold of by other parties and developed into a valuable property.

Dr. David C. Day, chief of the department of mines, who is busy preparing the statistical column of minerals at the Atlanta, Ga., Exposition, says: "You can see just how much coal is mined in Alabama in a minute, how much granite is quarried in Georgia in the same time. So with the rest of the minerals. I believe it will be better than the column exhibited at Chicago. There the output for one second was shown, here it will be for a minute. The column will be thirty-four feet high."

The Desert Queen gold mine and adjoining claims in the desert, on the border line between San Bernardino and Riverside counties, are reported in possession of McMillan & Co., of Denver, Col. The price paid was $100,000 for the Desert Queen; the five adjoining claims have been bonded. The Desert Queen was discovered by McHaney Bros. a few months ago, and a five-stamp mill has turned out considerable free gold. The new proprietors are credited with an intention to put up a 100-stamp mill.

At Wardner, Idaho, last Saturday the Bunker Hill Company paid its mill and mine employes for labor during the month $29,000, an increase of $10,000 over last month. It is thought the amount to be distributed by the company on the 15th of next month will exceed $35,000; this added to the Last Chance payroll for the month of September, which will be between $12,000 and $15,000, will give Wardner a payroll of between $45,000 and $50,000 per month.

A case of interest to investors in Mexico has been decided by the Supreme Court of the State of Durango. The Inde Mining Company, of which H. R. Walcott of Denver is president, wishing to reopen the mine Del Agua, which had been shut down, applied to the local court for an order ejecting an intruder, and one week later the company's representative was put in charge. The intruder applied to the federal judge for a stay of proceedings, but this was denied. The case is considered a test in the protection of foreign mine owners.

A London cable says: The speculative mania in South African stocks shows no sign of abatement. Stock Exchange dealers compare the present time with that of Law's Mississippi inflation in France and the South sea bubble in England. Men who were financially broke two years ago now boast that they are worth tens of thousands of pounds. Stocks that were quoted in June at £1 are now quoted at £40. Brokers who were recently struggling to keep their heads above the water now employ a large corps of clerks and net enormous profits. Barney Barnato, the leader of the boom, who at one time was an itinerant juggler, is now a multi-millionaire. He is about to build a palace in Picadilly which will cost £250,000.

Discussing phases of the South African gold mining boom, the current number of *Bradstreets* says: London's mining excitement has assumed a form which has had no parallel since the speculative railroad craze in the forties. Indeed, some of its manifestations recall the days of the South Sea Bubble, or Law's Mississippi scheme, which convulsed and nearly ruined France in the preceding century. The continental public has joined with avidity in the boom, and indeed, its remarkable vitality is in a great measure attributable to the glowing reports which the scientific delegates of German investors have made upon the condition and prospects of the South African gold fields. The London financial press continues to devote the major part of its space to mining matters. But while the intensity of the excitement, as revealed by enormous dealings, by large advances in all classes of mining and development company securities, and by the ease with which a succession of new ventures are floated, have been faithfully recorded, there is an absence of note of warning except of the most perfunctory kind. The same authorities which are so watchful in warning the public against American railroad securities indulge only in the quietest kind of admonition against the evils of overtrading where South African and West Australian mines are concerned. Viewing the recent record of the London mining share market, it is seemingly impossible to reject the conclusion that the craze is fast culminating, and that even with foreign buying its life cannot be prolonged for any length of time. As an example of the state of affairs which now exists, one of the leading London financial papers examines the record of a group of South African enterprises, consisting of eight mining companies and three trusts or financial concerns. A few months ago the market value of their shares was £11,935,000. They have since appreciated by the enormous amount of £13,528,000, the aggregate values at the current market quotations being no less than some £25,400,000. Inflation of this kind can have only one result. Nor is the market without incidents which, when viewed in the light of past experience, are even more indicative of coming collapse.

"Sending Pictures by Telegraph."

The illustrated description of "Sending Pictures by Telegraph" in the issue of the 7th inst. has elicited numerous communications. Probably the most interesting is one from Mr. Lowd, himself, which is as follows:

Office of Chief Dispatcher,
Northern Pacific Railroad Company,
Duluth, Sept. 13, '95.

J. F. Halloran, General Manager Mining and Scientific Press, San Francisco—Dear Sir: I was most agreeably surprised this noon at receiving copy of your issue of September 7th, and wish to thank you for the description and for the prominent place you gave it. I don't know where you got your information, but you did well by it.

The way I intend working it is to first put a picture on a chart and then write a cypher message from the chart, sending the cypher message the same as any other message and have it delivered as addressed. The person to whom sent has the duplicate sheets. He takes a sheet and the message and draws his lines from point to point, as indicated in the message. The operators do not see the charts at all, and only send the mixed-up mess of words and figures. The cypher message referred to in your issue only contains 463 words. Newspaper men know what *specials* of length cost. I can make a drawing on a chart from the cypher in less than 30 minutes' time, and I am not an artist. I only draw the lines from point to point. I've seen Mr. Willoughby's scheme, also some pictures in the *Call* of last spring, and also have read the telegraph account of the doings at Los Angeles, and came to conclusion that any artist, after reading the account of the affair, could have drawn the same or similar pictures; while in my scheme, if you notice the cypher, there is nothing except, perhaps, the last part that would lead any one to know what the drawing would be when finished. Again thanking you for the notice, I remain,

Yours truly, W. H. Lowd.

Regarding the source of information of which Mr. Lowd writes, the article was mainly compiled from one on the same subject in the issue of the *Electrical Review* of 13 Park Row, New York, of date August 21st, to which journal credit is due in the matter.

Critical Periods in the History of the Earth.*

NUMBER IV.

By JOSEPH LE CONTE, of the University of California.

II. THE POST-CRETACEOUS OR ROCKY MOUNTAIN REVOLUTION.

The next in order, going backward, is that which separates the Mesozoic from the Cenozoic, or more definitely, the Cretaceous from the Eocene. The physical changes which occurred at this time in America are (1) the unification of the American continent by the final abolition of the great interior Cretaceous sea which previously divided the continent into two parts, and (2) the formation of the Colorado, the Uinta and Wahsatch mountains. In America this may therefore be called the Rocky Mountain Revolution. Similar and even greater movements seem to have occurred in other continents, for the unconformities are even greater there than in America.

Here again we have widespread crust oscillations accompanied hy (1) great changes in physical geography, shown by very geueral, almost universal, unconformity of Tertiary on Cretaceous or on still lower rocks in every part of the world. Only in a few places on the American continent, *e. g.*, in the plateau region and in California, is the stratification douhtfully continuous. (2) By rapid changes of life-forms even where the sedimentation is continuous. (3) The iutroduction of a new and higher dominant class—the Eutheria. (4) Wide migrations partly permitted by changes in physical geography, and partly enforced hy changes of climate; and consequent great and rapid changes in organic forms, partly by pressure of a new environment, partly by mingling of faunas and floras, and partly by necessary readjustment to a new and higher dominant class.

The apparent suddenness of the change in organic forms—for example, in this case the appearance of Eutheria—is the result partly of loss of record (unconformity of strata), but mainly, I believe, of migrations (unconformity of faunas and floras). This suddenness, however, has in this case heen probahly exaggerated. Until recently, after the Jurassic Metatheria, no mammals were known until the Tertiary. But then, without apparent transition, an entirely different and higher type suddenly appeared in great numbers. The discovery hy Marsh of mammals in the uppermost Cretaceous was therefore hailed as probably filling the great gap. But according to Marsh these are all of pure Mesozoic types, and therefore bring us no nearer the origin of the Tertiary mammals than before. Osborne, however, finds them distinctly transitional, *i. e.*, as nearly allied to the Puerco, lowest Tertiary, Eutheria, as they are to the Jurassic Metatheria.

In this revolution the geographical chauges were probahly much greater than in the glacial, although far less known. The life changes were also much greater, except for the effect of man in the latter. As the drift represents deposits during the Glacial, so the Laramie those during this revolution. The Cretaceous proper was before, the Tertiary after, the Laramie during the revolution. The time occupied in the change and represented by the Laramie formation was very much longer. The hreak in the record was much greater and more general, but yet not universal, as witness the continuity of strata in some parts of the west. Undoubtedly Eutheria or true mammals appeared first in Arctogæa, as this was the great field of extensive migrations and the battle-ground of species, and therefore the place of most rapid evolution. From thence they spread by migration everywhere except isolated Australia.

These two periods, viz., the post-Cretaceous and post-Tertiary, were undoubtedly periods of very great and widespread changes, probahly affecting nearly, if not quite, the whole surface of the earth. Now, have we anything at all comparahle to these in the intervening Tertiary? Surely not. They are therefore properly called revolutiouary periods, and should be made the lines of demarkation separating primary divisions of time.

Among the changes of climate, perhaps of many kinds which took place in the last or glacial revolution, we find the most conspicuous is that of extreme cold. Do we find any such in the post-Cretaceous revolution? According to Dana there are some evidences of a cooler climate than before or after, but the evidence is not clear nor is it probahle that the lowering of temperature was extreme.

III. THE POST-PALÆOZOIC OR APPALACHIAN REVOLUTION.

Going still back the next, and perhaps the most conspicuous of all, is that which separates the Palæozoic from the Mesozoic. If we call the Permian a transition or critical period, corresponding to the Laramie and the Glacial, there is good reason to believe that it was of much longer duration thau either of the others. The readjustments of the earth's crust were much greater and it was much longer time before the equilibrium was settled and the organic kingdom again in a prosperous condition. The unconformity in this case was still greater and more general, and the loss of record, therefore, greater. The change in life-forms was simply enormous—the greatest that has ever occurred in the history of the earth. In Arctogæa the unconformity is almost universal, though not everywhere on exactly the same horizon. In the southern hemisphere, iucluding India, Australia and South Africa, there is little or no unconformity, but none the less are the chauges of life-forms great and rapid at this time, doubtless by change of climate and by migrations of conquering Mesozoic forms from elsewhere.

The mountain monument of this great period of change in America is the Appalachian Range. It is therefore called by Dana the Appalachian Revolution. But everywhere it was a period of great changes, and many other mountains originated at this time.

Observe, again, that the time intervening between this and the post-Cretaceous or Rocky Mountain Revolution, viz., the Mesozoic, was a time of remarkahle quiet and wonderful prosperity of the organic kingdom. It is true that here in America and elsewhere there were important changes in physical geography and some mountain-making at the end of the Jurassic, hut these changes were far less general and therefore far less potent in determiuing changes in the organic kingdom.

Among the causes of change in organic forms, one of the most potent is oscillation of temperature. Now the most decided evidences of glaciation known in any period except the Glacial are found in the Permian, and that, too, in many widely separated regions. This is especially true of Australia and South Africa, where the glaciation seems to have heen severe and undoubtedly connected with the great elevation and enlargement of the Antarctic continent, already spoken of. We have in these facts a probable key to the origin of the great reptiles of the Mesozoic. May they not have come by migration from the southern hemisphere, which seems to have heen the home (Karoo beds) of the earliest and most generalized forms of reptiles, viz., the Theriodonts? It is not prohable, however, that there were at this time any such geueral ice-sheeted condition of middle latitude regions as existed in the Glacial period, hut that there were severé and general oscillatious of temperature there is hut little doubt.

IV. THE PRE-CAMBRIAN REVOLUTION.

Last in the order of mention, but first in the order of time, and, so far as physical changes are concerned, by far the greatest of all, is the pre-Cambrian revolution. The Palcozoic era, especially in America, was a time of quiet, of prosperity, and steady evolution. Chauges occurred, indeed, during this time, many and great, hut not to be compared either in greatness or in wideness to those preceding and succeeding. The revolution at an end, viz., the Appalachian was more conspicuous than that before, only hecause of the great abundance of life both hefore and after, and the completeness of the change between. It was therefore equally conspicuous in the life-system and rock-system. The pre-Camhrian revolution was even greater in the rock-system (for judging by the universal unconformity it was literally a continental period between two oceanic periods), but there cau hardly he said to have been any previous life-system with which to contrast that of the Paleozoic. It is not improbable that further study will reveal other important divisions, but the meageruess of our knowledge makes it unnecessary to dwell further on this.

Aré there any mountain ranges connected with this revolution? Probably there are. The Laurentide mountains of Canada and the Adirondacks of New York are probably examples, but most of such have been swept clean away by erosion aud only their fossil bones left iu the form of complexly folded structure of pre-Cambrian rocks.

These four revolutions, then, I would insist on as marking primary divisions of time. Important movements occur between these, but far less general, and therefore far less effective in changing organic forms, and therefore should form the basis of subordinate divisions only. Three of these great revolutionary periods are generally recognized, hut the fourth and last, viz., the glacial, is not usually recognized as such. On the contrary, I regard it as the type, as the hest proof of the fact of critical periods, and as throwing ahundant light on the true character of such periods, and especially on the causes of the enormous changes in organic forms, during such times. These four, then, are the great landmarks of time. All other and lesser divisions are more or less local. If we recognize the primary divisious, then these become the fixed points for correlating the lesser divisions, as is uow being so successfully done by the U. S. G. S. in its admirable series of correlation papers.

(To be Continued.)

*Bulletin No. 11, of the Department of Geology.

Try the Number 49.

Here is a conundrum that is perplexing all the mathematicians of Philadelphia and vicinity:

A woman took a basket of eggs to the city for sale. Upon being asked how many she had she replied: "If I take the eggs out of the basket two at a time I have one egg left. If I take them out three at a time I have one egg left. If I take them out four at a time I have one left. If I take them out six at a time I have one left, but if I take them out seven at a time I have none left in the basket." How many eggs had she in the hasket?

The only answers that have yet come in make the smallest number 301 and so on up to interminahle millions, but ohjection is made that no woman's hasket could hold so many eggs. Perhaps she prevaricated.—Boston Herald.

The Broken Hill Proprietary.

John Howell, the manager of the world's greatest silver mine, leaves this coast on the Monowai for Australia on the 23rd. He mined with success on this coast for thirty-five years, aud has ably managed the great property entrusted to his charge. In recent conversation with an *Examiner* reporter he said: "I was for thirty-five years a practical mining man in California, Nevada, Utah, Arizona and Montana, so that I served quite an apprenticeship in the business hefore becoming the general manager of the Broken Hill Proprietary mine in Australia. The mine was located ahout ten years ago. It is situated ahout 300 miles from Adelaide, New South Wales, in the uorthwest corner of that country. The lode is ahout two miles in length, and stands up ahove the level of the plains, at the highest point, ahout eighty feet. It is an immense surface outcropping of iron-manganese, carrying about 15 to 28 per cent of lead, and from four to twenty ounces of silver to the ton. At the time of the locatiou of the mine the best ore found was of too low grade to pay for working, but at a depth of sixty to seventy feet a much richer hody came in aud extended to a depth of 400 feet. At the latter depth we struck water and the ore changed to a dense refractory sulphide iu place of the oxidized ore we had been working. This sulphide contains a high percentage of zinc, which is difficult to handle, and as a consequence the mine has practically heen worked only down to the 400-foot level.

"In the uine years that the mine has been worked it has yielded over 70,000,000 ounces of silver and upwards of 300,000 tons of lead. For the past six years it has paid six million pounds sterling in dividends. In the first three years it paid about $500,000 a month in dividends, hut since the fall in the price of silver it has been paying about $250,000 a month. There are about 16,000 stockholders, half of them in England, and the majority of the remainder in Australia.

"Connected with the works is one of the largest metallurgical plants in the world. Twenty-four eighty-ton capacity smelting furnaces are in coutinual operation, and there is a large leaching and chloridizing plant, a sixty-stamp mill and a hnge concentrator. The company employs hetween 4000 and 5000 hands. The fleet of vessels in the employ of the company is very large, as there is a continuous arrival of vessels from Sydney with coal, from England with coke, and from Oregon with lumber. The output of the mines goes to England, China and India.

"The character of the ore we are now working will last about a couple of years longer. It will become exhausted, and then we shall have to depend on the sulphides, which are very difficult to work, hecause so much coal is required and fluxes must he used in large quantities. The ore must he taken to the seaboard, where both these necessaries can he most readily ohtained. I am now going to erect a plant, that is to say, a metallurgical works, at the seaboard, which will cost about $1,000,000, for the treatment of the Brokeu Hill ores and similar refractory ores of other Australian mines."

"Prospecting" and "Mining."

A "distinction and a difference" is made by the *Colliery Engineer and Metal Miner*, which, in the current issue of that excellent journal in an article on prospecting and mining, says:

"Prospecting" may roughly he defined as lookiug for precious metal we hope and helieve exists, but of whose actual presence we have no positive assurance. "Mining," on the other hand, is when we have actually found ore and are following aud developing it. Under this definition there are many kinds of prospecting. There is prospecting for mineral leads with pick and shovel and for placer gold with a gold pan and rocker. There is prospecting on a bigger scale hy diamond drills, such as are now puncturing the mountains above Leadville in search of the gold belt. It is prospecting on a gigantic scale when a large company, like one at work at Idaho Springs, drives a tunnel for five miles through the mountains in search of veins of gold, some of which they know to exist, and others they hope to find. It is prospecting still when, as in the present case, a company undertakes to work the gold-bearing sands of Clear Creek on a gigantic scale and with gigantic aud novel appliances. Instead of the miner's little ditch or sluice, they have constructed a flume a mile or more in length, twelve feet wide and eight feet deep to turn the course of the primeval torreut and carry its waters bodily on one side, so as to expose and lay hare an interval of a mile and more of the river bed for their operations. Instead of the miner's little pipe short tom or long

om and driblet of water, the latest invention, Allen's big stave pipe over three feet in diameter is brought to bear and has been laid down for a mile, while attached to it is another mile of black steel sixteen-inch pipe forking at the end to accommodate two giant nozzles with a pressure of 125 feet vertical head and a force like that of a cannon.

Mine Development the Basis of Wealth.

NUMBER II.

TO THE EDITOR:—When I penned article No. 1, published in the PRESS of August 31, 1895, I thought possibly I was substituting my pen for a stick in a hornet's nest, and I have not been altogether mistaken, judging from some of the letters I have received. Miners are very touchy respecting their rights, and no one knows that better than I do. At the same time I know they aim to be just, and I know further that the majority know I am right. They now hold claims on a very slight tenure, and what I want to see is their holding fewer, having more security, and more wealth in consequence, and at the same time giving others a chance in the field, to say nothing of the general good gained by more activity for labor. From one of these letters I extract as follows: "Mine development is naturally the basis of prosperity, yet you cannot expect owners of mines with small capital to develop unaided their property, and I must take exception to compelling poor men to sink 200 feet or tunnel 300 feet before they could be granted a title. This would work a decided injury to the poor man, and is manifestly unfair."

I do not see it in this light, as, according to present laws, before applying for a patent you have to *swear* to $500 worth of work having been done on the claim and besides pay from $300 to $700 before you can get your patent. Now wherein is my plan "manifestly unfair?" My plan puts the $300 to $700 into development instead of its going into the pockets of greedy office holders.

Another letter says: "Have read your article in the PRESS. What is a man to do who has a mine and no money to work it? This is still the question." There is a longer story for an answer to this than for which I should use your valuable space, but I will ask: What *should* a man do with a mine and no money to work it? Lay by it, and simply dream of its unknown wealth or show some spirit in some way for getting assistance? In my first article I gave one plan, and here I will say: Why is not co-operation of mining labor as desirable for helping the "poor man" out as in any class of industry? I will further answer this question by saying: Develop your mines by co-operative labor, if not by any other way, and then sell them. *Bear in mind that every fairly developed mine is salable at a price in correspondence with developed value.* Let every miner write this on his forehead and go to work developing his property.

One or two more quotations from letters and I will pass on to other matter. One says, speaking of a certain mine: "It has not been worked for from thirty-eight to forty years, it being in the hands of those who could not work it properly." Another writer says, speaking of another mine: "It has not been worked for the past thirty years." Is it not wonderful that men will hold any mine, which they assure you is "rich," for thirty and forty years, doing nothing comparatively? The extent of this general holding, from year to year, of seeming mines is a very great detriment to the progress of every mining community, and does not such confessions clearly prove the correctness of my position?

The fact is that our whole governmental system of mining laws want readjusting to bring mining up to the spirit of the times. In this connection, too, the matter of the miners' right to the mineral lands must be determined so solidly that there will be no mistaking it, for, between the agricultural claimant and the railroad, the vested rights of the miner are getting very frail; and here let me say that, without the most active attention, some fine morning the greater number will wake up and find even their yearly half-worked claims have been gobbled up by the railroad power, and let me call every miner's attention to the fact that the next California Miners' Convention, to convene in San Francisco on the 14th of October coming, should receive their most earnest consideration, as effective action must be taken or all is lost, and then will be enacted by the mining land organization of the powers that be what is to-day the work of the British South African Company, which secured from the English Government a territory in South Africa about equal to the mining sections of California, and now they require as a right to mine on the same a royalty of 25% of the gross product, so I am informed. That the railroad company sees this point, and is moving with its jesuitical slyness to this end, I doubt not, and also that they are not going to leave any stone unturned for securing title to the mineral lands within certain sections, the value of which gain could be estimated at more than a hundred million of dollars.

Miners want to bear in mind that one of the vital questions of the next convention is: Shall it be controlled by the railroad or will the miners prove true to their interests and be on hand to protect it? Not only should the miners of the State take a great interest in the coming convention, but every business man, as much will depend on the outcome. Some may say that mining is of but little consequence. Now, we can maintain our status as a State through our other varied products; but, while the financial world are such sticklers for gold, and have all other values based on it, why is it not the pursuit that should receive the greatest succor?

The mining patrimony of the whole Pacific coast must be cared for in the interest of the rising generations, for the time is coming, and that soon, when the whole labor element will be confronted with the greatest destroyer of comforts and prosperity for the many—the competition and cheap labor of the Orient. It is going to be impossible to stay it. We cannot or will not place barriers high or strong enough to keep it out when we take into consideration the servile, debasing, political drones who will sell their honor, their children's future and the dignity of their State for coin and position.

ALMARIN B. PAUL, M. E.

San Francisco, Cal., Sept. 16, 1895.

English Money for American Mines.

English investors are reported looking in a wholesale way to American gold mines. Their agents and experts are looking into the merits of nearly a hundred properties in this and adjacent States, their field of inquiry extending over into Mexico. Fortunes have been made in the South African mines during the last few years, and the English mind, excited by the pleasurable experience, is desirous of taking in the good things of the same sort in America. There is no "sucker" money afloat, and whatever investments are made will be the result of careful, thorough and painstaking investigation by the best-equipped experts that money can hire.

The matter is down to a strictly business basis. Our English cousin is not frightened off by big figures, but when millions are named he must be satisfied that there is a good profit ahead or he will not trade.

Hence it is that negotiations are proceeding slowly, but the drift is certainly this way, and in the course of a few months from $75,000,000 to $100,000,000 of British gold is reasonably certain to be transferred to American pockets in exchange for titles to mining properties.

British curiosity is also being directed to timber and coal properties in the United States, and English capitalists are considering several attractive propositions of that sort, some of them running into the tens of millions.

Since England stopped putting cash into America five years ago, a monstrous surplus has piled up in the banks and trust companies of the tight little island, despite the tremendous losses consequent upon collapses in Australia and South America and reactions in Africa, Central America and India. Banks are paying next to nothing for private funds, and they groan at the sight of incoming streams of eagles. London is a lake of money, bank full and running over.

It has been only within the last ninety days that the desire to invest has taken possession of the owners of the mighty treasure.

Is It Wise?

A great many miners are of the opinion that it would be cheaper to let the railroad secure title to mineral lands now in dispute and then buy them from the railroad. Is it wise to think so? Let us ask those who hold this opinion if they believe the railroad would sell them mining ground worth from $50 to $1000 an acre for $2.50 an acre. Here are a few cases which actually exist in this county, and we call the attention of those who believe it is better to let the railroad alone to these cases and ask their opinion:

1. A man has been working a mine for more than twenty-five years. He has very good ground, but never had it patented. The railroad has listed it. Is it wise for him to let them secure title and expect to buy it from them afterward? Will they sell it to him? If so, may they not get one of their tools to bid against him and thus raise the price?

2. A man has a valuable mining claim, but the land through which it must be worked has been listed by the railroad. Is it wise for him to allow the railroad to secure it? Will the railroad fail to ascertain its value? May the owner of the mine hope to escape being cinched?

3. A company has spent many thousands of dollars in running a bedrock tunnel and opening a valuable drift mine. After working for some time they find that the channel extends into adjoining land listed by the railroad. They try to buy it. Is it wise to presume the railroad will sell it for $2.50 an acre if they have it patented?

4. A man discovers a quartz ledge in the high Sierras where the snowfall is from fifteen to twenty feet, and lies on the ground from November to June. The ground is covered with thick chaparral and is so rough and steep that a bear can hardly make his way over it. The miner prospects his ledge, finds it a good one, and lays in a supply of provisions and thoroughly develops it. Satisfied of its value, he attempts to secure a title to it, when he finds the railroad has it listed for farming land. He goes to W. H. Mills to buy it. Mr. Mills inquires about the land, and finally asks $6 an acre for it. The miner, being poor, cannot pay that price and leaves. He goes back to see if he cannot do better. Mr. Mills has studied the value of the land for farming purposes in the mean time, and comes to the conclusion it is worth $12 an acre. The miner remonstrates, Mr. Mills becomes irritated, one word leads to another till Mr. Mills exclaims: "We'll know what it is worth and we'll get all it's worth, too." Suppose the railroad has a patent to the land, what could the miner do? Be cinched.

5. A friend of the above miner is told one day about the experience with the railroad. He knows of a location on an odd section that belongs to the railroad that prospects quite well, but his friend's experience discourages him. What is the use for him to put in years developing a claim, and then, when he has found it, be compelled to deliver it to the railroad or let some one buy it over his head?

These are true cases, and the words ascribed to Mr. Mills were spoken by him to a Placer county miner. We ask our sleepy mining friends if they think it wise to let the railroad obtain a patent to all the mineral land they have listed? If they are overbearing and grasping while the land is only listed, what will they be when they have grabbed all they can and have a patent to it?—Colfax Sentinel.

The Gold Boom in Africa.

American boom towns are ordinarily supposed to outdo the world in speculative advances, but nothing over here can compare with the appreciation which has taken place in African gold mine shares in London and Paris.

The Chartered Company of South Africa a year ago had an aggregate value of $20,000,000. To-day the holders of its stock find its aggregate value of current quotations to be $90,000,000. The De Beers Diamond Company has moved in a year from a total valuation of $60,000,000 to one of $100,000,000. The mines in the Witwatersrand district alone have risen in about seventeen months—from March, 1894, to August, 1895—from a quoted value of $80,000,000 to a quoted value of $424,000,000—over five-fold. In addition to the original companies included, "blind pools" have been formed to deal in the shares of these companies, and the stock of a single one of these—the Consolidated Investment Company—has risen from a nominal capital a year ago of $3,250,000 to quotations which make the shares worth to-day in the aggregate $21,250,000. A few weeks ago the Robinson South African Banking Company started with $15,000,000 nominal capital. The quotations have been rushed up to an aggregate of $41,250,000, and yet no report has been made as to the assets of this company. The Consolidated Investment Company has declared a 20 per cent dividend in six months, but no one knows out of what mines or properties its "investments" have been "consolidated."

In all the advances in these securities, based on a territory about as large as California, still unsettled, at a long distance from the seacoast, inhabited by savages, and with unknown difficulties in the way of its development, have reached in the London market $500,000,000. In 1890 the entire valuation of California after forty years of settlement was only $1,100,000,000. California is larger in area than this African gold region. It is more fertile and more accessible. It has a seacoast and a population of 1,500,000. It is now producing half as much gold as this African region, while in the past it has produced more than any sober estimate of the future African product, yet the paper profit of these boom companies in the past year and a half is nearly half as large as the total valuation of California.

A boom like this can only have one end. These "profits" of $500,000,000 will vanish. The speculation has been extraordinarily successful because these gold mine shares have sold in France. They have been bought in small lots on a scale so great that last May the transfer facilities were deadlocked for days and shares were not delivered until weeks after they had been purchased. French small holders are always tenacious. They buy to keep. This has supported speculation, and as early as issues were removed by their purchases new companies have been organized.

The British South African Company, which conquered the region last year, is at the bottom of this speculative craze. It has sold mining and other rights. These have been capitalized, subsidiary companies organized and a new set of shares sold. Lastly there are "investment" companies which deal in the shares of these various corporations and create a new capitalization. This inflated bubble has been preferred by English and French investors to American securities. Ten years ago the same investors were preferring Argentine and Australian securities to ours. Another great crash in England cannot be far distant. The last brought down Barings. Who can tell what this wilder speculation will sweep away?

Mining Summary.

CALIFORNIA.

Amador.

MASSA.—*Republican:* D. Gutman, who has a bond on this property, is sinking a prospect shaft. The mine is on the Massa place at Jackson Gate. It is the east vein of the mother lode, a continuation of the ledge found in the White and Bellweather mines on the south. The shaft has reached a depth of 40 feet. It is the intention to sink on the ledge for a distance of several hundred feet, and ascertain the quality of the ore at that depth. It is a question of quality, not quantity. There is plenty of rock, of low grade, the only point to be determined is whether it carries gold in sufficient quantity to pay. To settle that problem is the object of the present undertaking. If it proves of a paying character, the enterprise will be freighted with bigger results for Jackson than any mining enterprise that has been inaugurated here since the rehabilitation of the Zeile fifteen years ago.

ARGONAUT.—This company is steadily pushing the sinking of its shaft. The foundation of the air compressor is completed. A tunnel is being driven from the Volunteer ground west to tap the Argonaut shaft at a depth of about 200 feet. The tunnel was commenced many years ago, and run a distance of 100 feet. The work at present consists in clearing out this tunnel.

THE KENNEDY.—The Kennedy mine has been troubled for some weeks by an increased flow of water in the north shaft coming from the upper levels. Two small reservoirs have been constructed near the shaft, and the impression was that these were responsible for the increased water supply. To prove the matter, these reservoirs were emptied, and since then there has been a noticeable decrease of the water.

AMADOR QUEEN.—The shaft at the Amador Queen has been cleaned out to the bottom. The test crushing will be made as soon as the ore can be taken out. The company has been operating ou as economical basis as possible, but still has been put to considerable outlay thus far. About 30,000 feet of lumber from Whitmore's mill has been used at the mine in constructing buildings, ore bins, etc.

Calaveras.

RAILROAD FLAT.—E. H. Schaeffle of Murphys has sold the Keystone mine to E. C. Loftus of Sonora, who is grading for a mill and will put the old mine in good working order. The Keystone has been worked aloug the surface for many years for a continuous distance of about 900 feet. For want of a hoist the owners did not go below a depth easily worked by a windlass. During all these years the vein has given a value in free-milling ore of from $30 to $45 a ton. In the deepest shaft the ore carries a good per cent of sulphurets, which will now be saved.

A BIG BLAST.—Eleven hundred pounds of powder was fired by electricity on the 11th, in the uuderground passages made by the miners in the Central Hill gravel mine, near Murphys. Since the last of June a few miners were engaged in running tunnels, and side drifts to distribute a sufficient quantity of powder to thoroughly shake up a large area of gravel to facilitate its removal when piping is resumed next winter. Those who were present heard but a faint report when the electrical current accomplished its mission, saw the earth rise about three feet and settle, and the work was well done. Fissures and openings characterized the hitherto formidable bank, and when work is again commenced the moving of the gravel will be greatly accelerated.

GENERAL NOTES.—*Echo:* It is stated upon good authority that the Rasberry claim, situated on the Dead Horse lode in this town, has been sold for $15,000.

Parties interested in the purchase of the Pure Quill mine, have arrived in Angels Camp and are preparing to open the mine up in proper shape.

The Calaveras Consolidated gold mine, situated at Robinson's Ferry, has heen purchased by Mr. E. K. Stevenot, the locator and former owner thereof. Mr. Stevenot intends opening up the mine in a short time, in fact, is making preparations for that purpose now.

Jas. Deitrick, who has the Bald Hill mine, at Albany Flat, in charge, has put men to work freeing the mine of water. As soon as the water is taken out, the work of sinking the shaft will be commenced.

Mono.

THE SOUTHEND CYANIDE. — Bodie *Miner:* The Booker Flat Cyanide Plaut has commenced operations. It has a daily capacity of 150 tons of tailiugs. It consists of six leaching tanks, 20 feet in diameter, and seven feet high, two storage tanks of the same dimeusions, two water and stock solution tanks, sixteen feet in diameter and ten feet high, two tauks 5x6 feet, and four sluice boxes.

A special feature of the plaut is the method of charging the tanks, which originated with the owners. In order to obviate rehandling the tailings, it is so arraiged that teams pass over the tanks, on platforms, and the wagons are quickly emptied iuto the tanks, through movable griddles.

The system of leaching the tailiugs is very complete, and not a drop of solutiou is lost except what is carried away as moisture with the tailings after they have been leached.

This plant is owned by J. S. Cain, A. Soderling, J. W. Kelley, C. C. Radcliffe of Bodie, and A. J. McCoue of Virgiuia, Nev., and is managed by R. Recknagel who also manages the plant at the Bodie Tunnel Mill.

Nevada.

WILL OPEN UP THE TIP TOP.—*Union:* Negotiations are pending for the sale of the Tip Top property, adjoining the West Harmony. The mine will be worked through the West Harmony shaft. The ground is supposed to be good and the company that will work it will fully develop the mine. The plant at the West Harmony goes in the bargain, it being owned by the Stow estate. This is good news for Nevada City.

THE CROWN POINT.—*Tidings:* The Crown Point mine is bonded for $50,000, by a syndicate in Paris, a representative of the capitalists interested left Paris on the 14th inst., with the purpose of coming directly to Grass Valley in order to make a payment on account, and to start work on the mine. The entire purchase price must be paid within one year.

The negotiations leading to this deal were carried on hy use of the telegraph and ocean cable. Several years ago the Crown Point was thought to he sold in Paris for a large amount of money. At that time maps and samples of ore from the mine were taken to the French capital, and from the showing then made it was decided to purchase. On the eve of closing the bargain, the Panama Canal scheme exploded and investors were at once made shy of foreign propositions and the deal fell through. One or more of these original investors has retained an interest in the Crown Point purchase. By use of the maps and samples still on the field, this late deal has been brought about.

The Crown Point is undoubtedly a good property. A. Gauthier, the owner, has taken at least $130,000 out of the mine. Of late years it has been comparatively idle. The machinery is uot sufficiently heavy to work the mine at any considerable depth. Recently a drift has been run out from the air-shaft ou the 200-foot level, and a fine body of ore was encountered. With capital to replace the present light machinery, and to prosecute some development work, the Crown Poiut will be all right, even should the present deal fall through. The latter contingency, however, is not now deemed probable.

W. Y. O. D. ANNUAL MEETING.—The annual meeting of the W. Y. O. D. Mining Company was held this week, and the following were elected as the hoard of directors: J. R. K. Nuttall, Joseph Weissbein, Jacob Weisshein, Louis B. Parrott, P. T. Simonds. The board organized by electing the following officers: J. R. K. Nuttall, president; Joseph Weissbein, vice president and manager; Jacob Weissbein, secretary; Weissbein Bros. & Co., bankers, treasurer; Thomas H. Simmonds, superintendent.

Placer.

THE GRAY EAGLE.—*Argus:* Gravel paying $10 a carload has been struck in the Gray Eagle mine at Spring Garden. The significance of this development will be appreciated by all miners interested on the Forest Hill divide. For seven years the Gray Eagle Mining Company has been pluckily spending large sums of money in sinking a shaft 400 feet through the cement, and then when that failed of making the expected discovery a still larger sum has been expended in runniug a tunnel in the face of which, 600 feet underground, the strike has finally been made which will turn back the golden stream. Below the Dardanelles mine there has been knowu to be seven miles of channel, undoubtedly rich, hut so deeply huried that it has balked the efforts of many mining companies to find it. The Gray Eagle discovery locates this channel and at the same time proves its value. Other companies will now be encouraged to go ahead to develop this channel, thus adding materially to the gold product of this county for years to come and providing work for many miners. There is every reason to believe the channel to be the same as that mined in the Breece & Wheeler and Mayflower, and that it will repeat the phenomenal yield of those mines.

The Gray Eagle Company is a San Francisco corporation of which H. W. Gray is the president and T. G. Durning superintendent.

EUREKA CON.—*Sentinel:* One of the most extensive mines on the Forest Hill divide, is the Eureka Consolidated gravel mine, which embraces 3600 acres of land and extends over six and one-half miles of channel. The mine is owned principally by Felix Chappellet; W. H. Bailey, of Oakland, is also a large shareholder. Mr. Chappellet began buyiug up the property some fifteen years ago satisfied it was a good thing. The chanuel is supposed to be the same as the one worked in the Greek mine east of it and in the Dix mine west of it. The gravel sought after is the deep or blue channel although a great deal of the white or upper channel is known to exist in the holding. The company has already driven in one tunnel through the bedrock 1500 feet and tapped the channel. This tunnel proved too high although it crossed a bed of gravel 400 feet wide. Another tunnel, known as the Clara, was run into the hill about 210 feet but has since been abandoned and another has been started about 400 feet lower ou the same side of El Dorado canyon. It is expected that the channel will he tapped after running about 1800 feet through bedrock. Work is in progress for the erection of a building for the boiler, compressor and blacksmith shop. This building will he about 30x65 feet, built near the mouth of the tunnel and connected with it by sheds to protect the track from snow. A road has just been graded from the top of the ridge to a point just above the tuunel for the purpose of getting in the machinery.

In addition to other improvements the company has fitted up about a mile of the old Breece & Wheeler water ditch which carries water from El Dorado canyou, thus furnishing the mine with an ample supply of water power. The company's land is covered with much valuable timber and it is the intention next year to put in a small portable sawmill to supply the mine with timbers, etc.

The tuunel will he run large enough to allow a small engine for hauling the cars. The mouth of the tunnel is situated about 2½ miles east of the Red Point mine and at an elevation of 3914 feet above sea level, being over 800 feet lower than the main divide.

About twenty-one men are at present employed. Felix Chappellet, Jr. is superintendent.

Riverside.

GENERAL NOTES.—*Record:* The Alice mine and mill has started again. About eight tons of ore are being crushed daily. The ore being worked is sulphuret in character and runs about $75 to the ton, the proportion being about ten to one. Enough free gold is taken from the ore to pay expenses.

The Menifee mine is now shut down. A deal is now on by which the property will in ahout a month pass iuto the hands of a Boston company.

The Good Hope started up this week after being shut down for a few days, pending repairs in the mine. The mine and mill now employ between thirty-five and forty men.

The newly organized Leon Mine and Milling Company will work the Briggs mine and extensions. The Briggs will soon resume active operation.

San Bernardino.

GENERAL NOTES. — At Blackburn station Miller & Cram are shipping ore that nets $140 per ton after paying freight and milling.

At Vanderbilt mine owners are waiting for the extension of the California and Eastern railroad, when they will be able to handle ores more cheaply. The Campbell mine is being operated on ores taken from tbe St. George and Boomerang claims. The last cleauup from fourteen days' run produced $4200. There are twenty men at work about the mill and taking out ore from these two mines.

The Gold Bronze mine is now in the hands of Receiver W. N. Crandall. The stockholders of the company had run behind about $20,000 in the last year and a half; under the management of Mr. Crandall the mine is beginning to pay and the receiver is hopeful of being able to pay off all the debts from proceeds of the miue. The Gold Bronze is opened up to a depth of 250 feet, with fifty-foot levels extending 150 feet east and west from the main shaft.

Siskiyou.

AT HAWKINSVILLE.—*Journal:* Lambert and Morley intend running a 200-foot tunnel into the Aurora and Blessing quartz ledges on Canal Gulch, iu Hawkinsville mining district, to develop the same, with an option of $10,000 for the locations, if they turn ont as anticipated.

The Portuguese employed in the Espey, Hunter & Co. mine at Hawkinsville, struck for higher pay last week, or from $2 to $2.25 per day. A new crew of Americans has been employed, and the work continues as before.

NEVADA.

ON THE COMSTOCK.—Dan De Quille in Salt Lake *Tribune:* In the Confidence and Challenge mines at Gold Hill has been found a six-foot streak of ore that will pay about $40 a ton, nearly all in gold. In following this streak north it is found to widen. It may presently expand into a bouanza of considerable size.

Con. Cal. & Virginia is still yielding fairly well. They last week shipped to the Morgan mill on the Carson river 105 tons that averaged $51.05; the Hale & Norcross extracted 41 cars of ore that assayed $50.46 a ton; the Potosi people are repairing the main thoroughfares of their mine, and extracted but 54 tons of ore, assaying $29.42 a ton. At the Chollar mine two small streaks are being followed and prospected. One of these streaks of ore is on the 450 and the other on the 650 level. The streaks are expected to lead to ore bodies. During the week they yielded 25 tons of ore assaying $26.79 a ton. The Occidental is following a two-foot streak of ore on the 550 level that assays from $5 to $25. At the Crown Point all underground work has been suspended to await a milling stage of water in the Carson river. Most other companies are utilizing the season of low water hy making repairs. The Morgan mill ean be run, as it is provided with steam power for use during the dry season. The Carson river is now so low that no water runs over the dams.

The Kinkead Mining and Milling Company have commenced operations on the Con. Cal. & Virginia waste dump. They are getting about 65 tons of ore a day. A mill for working the material ohtained will be built at once.

AT THE BRUNSWICK. — All is progressing favorably in the development work started some weeks ago on the Brunswick lode by several leading companies of the main Comstock. Work is being done at those different points and is pushed day and night. Water-pipes are being laid from the city to the lode, which is ahout a mile east of the main Comstock, and is the most easterly vein of the Comstock system of quartz leads, and hoisting-works will at once be erected at the inclines. Prospecting work is also being done on the north and south extensions of the lode by individual owners of ground in those directions. Some of these fiud the vein strong, and claim to be ohtaining godd prospects.

AT SILVER CITY.—At Silver City the majority of the miners are doing well. Pedroli is taking out ore that averages $150 a ton. He has at least $20,000 in sight in his mine. His last clean-up amounted to $10,000, and his next will give him not less than $15,000. To obtain $1 iu gold costs him less than 25 cents. All the Silver City boys who are "in honanza" are making good wages.

The Oest mine is paying well. At the depth of 200 feet a heavy flow of water was encountered some years ago. The ore was very rich, hut instead of trying to go deeper the owners worked north and south and upward on the vein. Meantime the combination tunnel was heing run. This tunnel has been resumed and is heing carried down below the old water level in fine ore.

COMO COMING UP.—At last the mines of Como are to be prospected at depth. A company has been formed, with Col. Ed Boyle, the well known superintendent of the Alta, at the head as manager, to run a long drain tunnel under a promising section of the vein system. Work has already been commenced on this tunnel. It will reach the North Rapidan lode in going 900 feet. It will then be run in the lode a distance of 1600 feet to the Rapidan shaft. It is expected that paying ore will be found in following the vein. The tunnel will drain the ground to the depth of 600 feet. The company have secured the control of several large veins. Most of those concerned in the enterprise are Englishmen.

OUTSIDE GOLD CAMPS.—Reports from Silver Star continue favorahle. At the Gem mine Gen. Harrington has cut into another deposit of specimen quartz. Forty pounds of the ore yielded $1300 when pounded out in a mortar. It has been discovered that the surface dirt over the vein is full of gold. They have sacked several tons of it and sent it to a mill in order to find out what it will work. All the other mines that are in ore are getting big pay. Men who a few weeks ago secured leases on veins are now selling interests in the same at good prices.

At Silver Peak a mill of sufficient capacity to crush 60 tons of ore a day has been started up. It will use a leaching process.

At Austin the mill of the Austin Mining Company is regularly at work. A force of 70 men is employed. A fine concentrating plant is in operation.

In Union district, Nye county, a five-stamp mill has been started up. Tbe free gold is amalgamated ou plates and concentrates are saved for shipping.

Prospectors, searching for gold, are pushing down into tbe Death valley country.

NYE COUNTY.

UNION DISTRICT.—The prospects near Ione are reported to be flattering. A party of Eastern capitalists have bonded several mines in the vicinity of Ione, which will be operated by them. Although the ore is of a medium grade, the conditions of the district will make mining on a large scale profitable, wood and water being plentiful.

OREGON.

PLANT FOR THE CORNUCOPIA.—*Tribune:* The machinery for the uew twenty-stamp mill on the Cornucopia mine, near Baker City, Or., is rapidly being placed in position, and, it is expected, will be in operation by October 15th. Frazer & Chalmers are furnishing the machinery, and a represeutative of that company is now on the ground. The plant will also be arranged for the chlorination of ores.

THE ASHLAND MINE.—Thos. James, who has had charge of the recent work, brought to the Selby Smelting and Lead Co. last week 23 tons 600 pounds of ore for reduction. The ore yielded $133 per ton. The gross returns of the 23 tons 600 pounds amounted to $3000. The cost of production was $600. This ore was the product of the work of four men for thirty-two days. Work has been resumed at the mine.

GENERAL NOTES. — Superintendent Geiser, of the Bonanza mine, arrived in Baker City, last Wednesday, with 300 ounces in gold, or $4800, the output of the Bonanza mine for two weeks. August 21st last, Superintendent Geiser brought in $5000, the result of two weeks' cleanup.

The *American Banker* of September 4th, a paper published in New York, contains the following: "Horace L. Hotchkiss & Co., have sold a gold mine property located at Quartzville, Linn county, Oregon, on a basis of valuation of £100,000. That means $500,000 for the mines now being developed under the management of W. B. Lawler."

In southern Oregon, the Grant's Pass *Courier* notes in course of construction a mile and a half ditch to tap Gunnry & Speneer's placer on Jones creek, a mile ditch in Galice district; a 16-mile ditch for the Illinois Mining Company; a supply ditch on the Clark placer on Grave creek; a five-mile ditch on the upper Grave creek for the Hampton mine. It also notes that a five-stamp mill will be erected on the Suprise lode on Dry diggings, and a big excitement at the Steamboat mine, 13 miles above Williams, in consequence of the old tailings assaying $800 to the ton. A seam of rich ore ahout an inch and a half thick accompanies a "hlanket ledge" for several hundred feet, and this seam assays over $1000 to the ton. An assay was made last week on some concentrates which figured up $103,000 to the ton.

JOSEPHINE COUNTY.

A COPPER MINE.—W. S. Elmer, of Baltimore, Md., is in this city, on his way home from a visit to the Siskiyou Copper Mining Company, now operating in Josephine county, 32 miles southwest of Grant's Pass, of which he is president.

The company owns twenty-one claims. A mountain road, 12 miles in length is finished, and a smelting plant, twenty tons capacity, is being erected. On the claims prospecting work is heing carried on, and a series of tunnels run to learn the real extent of the ore body. The assay value of the rock ranges from twenty-six to sixty per cent copper, with a showing of gold, and it is anticipated that copper will be shipped before snow flies.

About 100 men are at work on the new Hampton ditch on Upper Grave creek. The aqueduct is to he five miles long, seven feet wide at top, four feet at hottom, and three feet deep. The wages paid men vary from $1 a day to $2.50 and board.

BRITISH COLUMBIA.

GENERAL NOTES.—Ashcroft *Journal:* The O. K. Mining Company has refused $10,000 for its mining property at Stanley.

J. B. McCorkle of Chicago will soon recommend Chicago capitalists to spend $50,000 on a dredging plant on the Quesnelle river, seventeen miles from Quesnelle.

Charles F. Fishhack of Seattle has purchased tbe property of the Quesnelle Mining

and Dredging Syndicate, and will work the rights by an entirely new process.

Midway *Advance:* Work has been resumed on the 200-foot shaft the Boston-Butte Company is to sink upon the Cariboo, Camp McKinney. The purchase is not yet complete.

A strike has been make at Baker creek, three miles from Anarchist mountain. The ledges are from 40 to 50 feet in width. It is supposed to be a continuation of the Trail creek ore.

Final arrangements have been made for the building of a 50-ton smeltor at Midway by S. S. Fowler of Chicago and W. T. Thompson of Fairview.

New Denver *Ledge:* Twenty tons of ore will be shipped from the Cordella. It assays 211 ounces in silver.

Tunneling, preparatory to shipping ore from the Slocan Queen, was started last Monday.

There will be considerable ore shipped from the Springer and Ten Mile creek districts this winter.

A concentrator is at present turning out a carload of Alamo concentrates daily, averaging about 125 ounces.

About 45 feet of shafting has been sunk on the Currie claim on the Galena Farm. There is about 30 tons of shipping ore on the dump and over 100 tons of concentrating ore is now ready for shipment.

Nelson *Tribune and Miner:* Wages for shovelers at the Silver King have been reduced from $2.50 to $2. Only three men continued work.

I. Williams, who has been foreman on the Slocan Star, has resigned to manage the North Star, Fort Steele, owned by Mann and Holt, of Montreal. A $20 rate has been obtained to the smelter and the ore runs $50.

The four and a half tons of ore from the Fern, on Hall creek, 12 miles south of Nelson, has been run through the Poorman mill, and the yield was about $100 a ton in free gold saved, and the sulphurets assay over $600 a ton.

Rossland *Miner:* The Le Roi has 97 men at work.

The Homestake ore assays $50 in value.

F. A. Heinze will have a controlling interest in the Trail creek smelter, which will handle 100 tons of ore per day. The site has been cleared and the new works will be ready by November 1st.

A ledge assaying $36.05 in gold, 82.5 ounces silver; another sample $7.70 in gold, 149 2-5 ounces silver, and the third $3.65 in gold and 54.5 ounces silver, is reported to have been struck on Springer creek.

ALASKA.

THE BEAR'S NEST MINE.—Testimony is being taken at Portland, Or., before United States Commissioner Sladen in the case of A. G. Renshaw against the former owners of the Bear's Nest mine. Renshaw charges that the sale of the Bear's Nest group of mines, on Douglass Island, Alaska, was accompanied by fraud, and accuses the defendants of conspiring to make the sale by placing gold-bearing rock from the rich Treadwell mine in the barren mine adjoining, and by fraudulently treating the core from a hole bored by a diamond drill to make a showing of rich ore.

R. M. Breereton, the third expert sent out from England to examine the Bear's Nest group of mines, I. B. Hammond, J. S. Laidlaw, who was a resident of Douglass Island and employed in the mines there while the sale of the Bear's Nest was being effected, William Stitt, Portland, and F. O. Downing, who was one of the stockholders of the Bear's Nest mine, are among those whose testimony is to be taken.

A DIFFICULT COUNTRY. — In parts of the interior and northern Alaska the miners have to contend with underground ice, which in placer work is as bad as meeting rock. The ground is not merely frozen but consists in parts of layers of ice alternating with sand and clay, having the granular texture of glacial ice. The remains of mammoths, etc., are found in the clay overlying the ancient ice masses.

SOUTH DAKOTA.

THE HOMESTAKE COMPANY.—The Homestake Company of the Black Hills have decided to add forty more stamps to the Golden Star mill, thus making an even two hundred. A new Corliss engine of 500 horse power will replace the one recently wrecked. The improvements will require between three and four months to complete; but when the mill again starts up, more men will be employed in the mines connected with it, as it will require about 800 tons of ore per day to keep it in operation.

WYOMING.

THE FORTUNATUS M. & M. CO.—The Fortunatus Mining and Milling Company, which has been working claims at Bald mountain, near Sheridan, has at last struck gold in paying quantities. The general manager of the mines, who has just returned to Sheridan, says: "All our stamp mills are now running, and the conglomerate is averaging from $8 to $20 a ton of pure gold. We have thirty stamps at work running night and day. I have telegraphed an order for more stamps."

IDAHO.

THE CŒUR D'ALENES.

TIGER AND POORMAN.—F. R. Culbertson, the general manager of the consolidated Tiger and Poorman properties says: "The Poorman is closed down and it is not likely that work will be resumed for some time. In course of a few weeks we expect to close down the Tiger for awhile. A number of changes will be made and it is very improbable that any extensive mining operations will be resumed on the consolidated properties before spring.

"The Poorman hoist will most likely be moved into the Tiger mine to replace the present Tiger hoist. Some water wheels will be added so as to utilize the Tiger water power. This will result in the abandonment of the Poorman shaft. The pumps of the Poorman will also be moved to the Tiger as fast as we have occasion to use them. At this time the only work being done on the Poorman is pumping water, and this work will be turned over to the Tigor within the next week or ten days. The pump recently put into the 900-foot level of the Tiger has a capacity of 600 gallons per minute, and can easily handle the water for the two mines. A tramway will be built from the Tiger shaft over to the Poormau mill, and some changes will be made in the Poormnn concentrator."

COLORADO.

IDAHO SPRINGS.—*Mail:* The Gulf road reports handling 179 cars of ore outbound from Idaho Springs for the month of August, compared with but 84 cars for the same month last year. This is an increase of more than double within one year. The mills in Idaho Springs have a combined daily capacity for treating 555 tons of ore. A careful estimate for the month of August shows the output of lower Clear Crock at $200,000. The outlook for September is even more encouraging.

A new fifty-ton concentrating mill is about to be erected at Idaho Springs by the Denver Public Sampling Works.

NEW MEXICO.

HANOVER.—Silverton *Enterprise:* Since the advent of the new Mexico and Arizona Smelting Company, and the opening of the company's copper matteing furnace, Hanover is improving. The smelter is running steadily and shipped two cars of matte during the past week, with nearly another car ready for shipment. Forty-two teams are employed hauling ores from the various camps to the smelter. The Home Ticket and Two Jacks mines, at Lone Mountain, owned by Hon. Richard Hudson and Jack Frost, are shipping steadily to the smelter. Several hundred tons of the waste dumps of these mines are being shipped at a good profit.

Fifteen to twenty men are busy at work opening up the long idle mines of Lone Mountain. Some very rich ores are being discovered, but the large bodies of low grade ores can be handled at a profit as the limestone gangue serves as the necessary flux at the smelter. The miners are netting from $6 to $10 per ton from their old waste dumps.

ARIZONA.

THE MINERAL HILL GROUP.—Tucson *Citizen:* The Mineral Hill group of mines in the Sierritas are pushing forward as ore producers. About eighteen men are at work on the property and ten to twelve teams are constantly engaged in hauling ore to the smelter.

A LIVE CAMP.—The Congress Mining and Milling Company now employ nearly 300 men in their mine and mill. They crush about 100 tons of ore per day. There is also an output of twenty tons per day of shipping ore. A cyanide plant below the mill handles over 100 tons of tailings per day, from which $9 a ton is extracted.

The company is replacing their electric light plant with a larger one, so that they can light their mines and a large new mill they are preparing to build, which will be worked in conjunction with the old one. It will be the Cornish rolls and will handle 300 tons more ore a day. It will be the cyanide process and they will work what is known as the large vein or Congress proper. The mine consists of two streaks of ore in the same vein. The small vein on the foot wall is four feet on the surface, but as depth was attained large bodies of ore were encountered. They are in 1500 feet on this ledge, which is larger and richer on the bottom than anywhere near the surface. The ledge is 100 feet above this and crops out 12 to 15 feet on top. This ledge has only been worked to develop it and prove its value, and three crosscuts are being driven deep down—one from the bottom of the small vein, which will cut it 1600 feet from the surface.

The Planet-Saturn people, of Fools Gulch, are making preparations for work on an extensive scale. Grading is being done for boarding houses, hoisting works, etc.

GENERAL NOTES.—Owing to the recent rise in the price of copper, the Copper Queen Co., at Bisbee, has restored wages to the rates prevalent before the panic.

The Coarse Gold mine, formerly known as the Mexican mine, near Wickenburg, is again turning out many gold nuggets from its thirty foot quartz ledge.

Davis, Wetmore & Co., of Montana, have purchased the Old Figueroa gold mine at Potboles, twelve miles above Yuma, for $36,000, upon which they will erect a ten-stamp mill.

In the Cerbat district, Mohave county, Charles Gross and his partner Canias, are taking ore from the Gold Bar mine that will go $2,000 to the ton and are running their arrastra.

YAVAPAI COUNTY.

At Chaparral the trestle from the tunnel to the mill is completed. When the tunnel through the mountain on the other side is finished, the ore will be carried in cars which will run by gravity into the mill, and dumped into the new ore bins and from there to the battery, making a saving of $1200 per month.

Total Coinage for August.

The coinage executed at the mints of the United States, during the month of August, was as follows:

Denomination—	Pieces.	Value.
Double Eagles	94,000	$1,880,000
Eagles	23,000	230,000
Half-Eagles	312,440	1,562,200
Total Gold	429,440	$3,672,200
Half-Dollars	500,000	$ 250,000
Quarter-Dollars	1,912,000	478,000
Dimes	200,000	20,000
Total Silver	2,612,000	$ 748,000
Five Cents	1,756,000	$ 87,800
One Cent	960,000	9,600
Total Minor	2,716,000	$ 97,400
Total Coinage	5,757,440	$4,517,600

Books Received.

"Fourteenth Annual Report of the United States Geological Survey, 1892-93," by J. W. Powell, 8vo., two parts.

Part I is devoted to the report of the director and his assistants, expense accounts, etc. Part II is a handsomely illustrated volume of papers on the geological features of different parts of the country. Of local interest are the one on "Tertiary Revolution in the Topography of the Pacific Coast, by J. S. Diller, and "The Rocks of the Sierra Nevada," by H. W. Turner. In treating of the topography of the Pacific coast the first paper takes up the term "Klamath Mountains" as a distinct term. The name "Klamath Mountains" is not yet in general use and requires explanation. In northwestern California and southwestern Oregon, where the Sierra Nevada, Cascade and Coast ranges meet, there is an irregular group of mountains, extending from the fortieth to near the forty-fourth parallel, N. L., for which there is no general name. The various ridges and peaks of the group, including the Yallo Bally, Bully Choop, South Fork, Trinity, McCloud, Marble, Scott and Salmon mountains in California, as well as the Siskiyou, Rogue River and others in Oregon, have all been specially designated. Investigation has shown that the geological history of this group has been essentially the same throughout, and that there is need of a general name for the whole group. For this purpose it is proposed to use the name "Klamath Mountains," using the name of the river, which, in a deep canyon, cuts directly across the group from the interior platform and the Cascade range to the ocean. The geological structure of this region is given extended description, showing that during the Cretacious period the land in that region extended westward to the continental border, ten to thirty miles beyond the present coast line into the Pacific.

The second paper, discussing "The Rocks of the Sierra Nevada," takes up the geology of that extensive system, the treatise containing an interesting dissertation on the formation of the ancient river channels and their present lava caps. The report is of great practical value, and will receive subsequent notice at greater length.

"Proceedings of the Third Annual Meeting of the Lake Superior Mining Institute."

This includes an account of the meeting, a paper on the "Iron Ranges of Minnesota," by H. V. Winchell, an address by the retiring president, J. P. Channing, "Distribution of Phosphorus and System of Sampling at Pewabic Mine, Mich.," by E. F. Brown; "Efficiencies of Some of the Pumping Plants on the Menominee Range," by Per Larsson; "The New Pumping Plant of the Stirling Iron and Zinc Co., N. J., "The Hoisting Plant of the Lake Mine, Cleveland Iron Mining Co.," by J. M. Vickers; "The Relation of the Vein at the Central Mine, Keweenaw Point, to the Kearsarge Conglomerate," by L. L. Hubbard; "Open-pit Mining, with Special Reference to the Mesabi Range," by F. W. Denton; and a communication upon the cost of crushing hard hematite.

"Annual Report of the Secretary for Mines, Victoria, for 1894:" Robt. S. Brand, Government Printer, Melbourne; price, five shillings.

The first part is a report by Secretary A. W. Howitt, dated May 29, '95, of the general condition of the mining industry, reports from the government geologist, palæontologist, board of examiners, and mining inspectors. The second part is an illustrated description of the latest improved mining machinery, compiled largely from American mining and scientific journals. The third part is a report on diamond drills and drilling, with incidental descriptions of the several mining districts. Part IV is composed of statistics, from which it is learned that the total yield of gold in the colony of Victoria for the year ending December 31st, '94 was 673,680 ounces. Each district's yield is subdivided, and the returns minutely made, the same as from the different counties of this State for '94, which have been compiled by the State Mining Bureau, and, it is expected, will be shortly published. The dividends declared in the several districts of Victoria during the year aggregate £459,721. The number of "alluvial" and quartz miners at work during the year is set down at 27,889; of these, 13,019 are set down as "alluvial" and 14,870 as quartz miners. Of the "alluvial" miners, 10,907 were Europeans and 2112 Chinese; of the quartz miners, 14,754 were European and 116 Chinese. During the year there were fifty miners killed and eighty-three injured by mine accidents. Of these fifty fatal casualties, 28 were occasioned by falls of earth, rock, etc., underground; 4 by men falling down shafts, 4 by men falling down winzes and shoots, 5 by falls of materials down shafts, 2 by cage accidents, 3 by explosions of powder, 3 by explosions of nitro-glycerine compounds, and 1 by truck accidents. Table No. 9 shows the weekly salaries paid for different kinds of labor in the different divisions and districts. In the several districts the general manager's weekly salary varies from £2 10s in Rusbworth division to £10 in Sandhurst division of Sandhurst mining district; "legal managers" of mines are paid weekly from 10 shillings to £4; mining managers from £3 to £8; engineers average £3; shift foremen, £2 10s; miners, £2 5s; "surface men," £2; Chinese, £1 10s. The report is handsomely issued and bears evidence of careful editing.

Personal.

SUPT. G. McM. Ross has resigned his position at Iron Mt., Shasta.

MR. H. K. THURBER, formerly of the wholesale grocery house of Thurber & Co., of New York, is now operating the French group of mines near Hailey, Idaho.

Commercial Paragraphs.

THE Trenton Iron Company has a contract for a wire-rope tramway to be used for hauling logwood in Hayti. The order amounts to about $100,000. The structural iron work in connection with it calls for about $50,000 more.

THE Fulton Engineering and Shipbuilding Works have a contract to put in ten additional stamps at the Santa Rosa mine, near Perris. They have a contract with E. W. Chapman for a 40-stamp mill, air compressor, etc., at the Zintgraf mine, Amador Co.

THE Union Iron Works has the contract to furnish the new 40-stamp mill for the Champion Mining Co., Nevada City. This, with the 30 stamps now in operation, will make 70 stamps; it is calculated that the Champion, Wyoming and Merrifield have enough quartz to keep them going for an indefinite period.

THE Vulcan Iron Works of San Francisco are constructing a Vulcan wire ropeway, to transport sixty tons of ore daily, for the Ball Mt. Mining Co., Montana. They have recently shipped one of their large Vulcan band saw mills, for sawing logs, to the Sanger Lumber Co., Fresno, Cal., and are building a double circular saw mill complete for parties in Guatemala, C. A.

H. K. PORTER & Co. have shipped two pneumatic locomotives, one to Alaska and the other to British Guiana in South America, both to be used in gold mines. These locomotives consist principally of two huge steel cylinders seventeen feet long mounted side by side, in which the compressed air used for motive power is stored. Those shipped as stated have a capacity of 130 cubic feet and are provided with producing valves which deliver the air to the cylinders, pressure from 100 to 140 pounds. The engine is five feet high and weighs 18,000 pounds.

THE Pelton water wheel is distinctively a California product, and is justly regarded as one of the most useful and illustrious inventions of this or any other country. By means of it water is converted into power in so simple and economical a way that the machinery can be said to be almost dispensed with. Thousands of these wheels are sent out every year to all parts of the world, and the manufacturers claim that in no single instance do they fail to meet the most sanguine expectations of the purchasers.

A very high honor has been paid the Pelton Water Wheel Co. recently, in the award by the Franklin Institute of Pennsylvania of the Elliott Cresson gold medal, made as a just recognition of what is regarded by them as one of the most valuable products of American genius that has ever been produced.

This award is accompanied by an elaborate and exhaustive report made by a committee of scientists appointed for the purpose, which traces the history and progress of water-wheel practice from the early centuries down to the most modern and improved methods. The report concludes with the following paragraph:

We have given this invention the fullest and most unbiased examination permissible, within the time allowed us and within the compass of the literature at our command. We conclude that the Pelton water wheel possesses all the advantages of simplicity of construction, economy of installation and maintenance, adaptability to extreme heads of water, transportability, a close and sensitive automatic regulation, and of high speed, which belong to other wheels of its class which have preceded it, but for efficiency it has excelled all others.

We therefore deem the Pelton water wheel worthy of the Elliot Cresson medal, and hereby recommend the award of same to Lester A. Pelton, the inventor of this wheel.

Adopted at the stated meeting of the Committee on Science and the Arts, held February 6, 1895.

The Anti-Debris Association.

The State Executive Committee of the Anti-Debris Association met last Tuesday in Sacramento. Manager Phipps submitted his monthly report, showing the mines visited by the watchmen and stating: "It being a time of the year when the miners can do but little or no work, except to prepare for the coming season, I have had but one watchman on at any time. On the 22d of August a hearing was had before the California Debris Commission on the application of John Pascoe for a permit to mine in White ravine, in El Dorado Co. This is the party who mined in 1894 under permit, and whose dam in Chile ravine was carried away by last winter's storms. The Association filed a protest against the granting of a permit."

George Ohleyer, Chairman of the Legislative Committee, made a report upon legislation to come before the coming session of Congress.

The president and secretary were directed to write to the State Board of Examiners, stating that the act providing for a debris commissioner and his secretary, declared that they should receive compensation only while engaged in the performance of official duties, and charging that they have no official duties to perform, and that the act is inoperative.

The attorney of the association, Robert T. Devlin, was called upon for a report of the legal affairs of the association. He reported that the case of the United States vs. the North Bloomfield Gravel Mining Company would be heard on motion to relieve the superintendent from the operation of the case, on demurrer next week. In accordance with instructions received from the association, two suits will be commenced this week, one against persons mining by the hydraulic process on the Yuba, and the other against persons mining on the Feather. The papers are prepared and suit will be instituted the latter part of the week.

A communication was received from Congressman Grove L. Johnson in regard to securing appropriations at the coming Congress for river improvement.

The committee adjourned to meet at the same place in October.

Scientific Progress.

Is the Sun a Magnet?

The theory that the sun affects the earth either electrically or magnetically, or in both ways, has had until recently little convincing evidence in its support. The diurnal swaying of three magnetic needles with which magnetic observatories are equipped, the greater range of that swing at the maximum stage of the eleven-year sun-spot period, and the apparent coincidence in time between observed outbreaks upon the solar surface and the associated terrestrial phenomena of auroras, earth currents and magnetic storms have been adduced, but the first two were not conclusive, being susceptible of more than one interpretation. It has been deemed probable that the diurnal journey of the magnets was due to the movement of atmospheric currents, set in motion by solar heat, but charged with electricity of purely terrestrial origin. An increased heat emission from the sun at the sun-spot maxima, if it could be shown to exist, would, on the foregoing theory, account for the greater range of the diurnal swing at such times.

New evidence, however, has been brought forward. The electro-magnetic theory of light, originally advanced by Clerk Maxwell, has received confirmation by the German investigator, Hertz, and it becomes easier than before to believe that the diurnal magnetic phenomena are brought about by the luminous rather than the thermal radiauce of the sun. There are still some difficulties to be cleared up, and the case is not to be considered as proven; but distinct headway has been made.

Professor F. H. Bigelow, of Washington, D. C., in the *American Journal of Science*, shows some new facts which reflect credit upon the investigator and the branch of the American Government with which he is identified. For several years Professor Bigelow has been working at a task which the International Congress of Meteorologists abandoned after a decade of special study—the demonstration of a connection between weather phenomena and terrestrial magnetism, and the establishment of a new meteorology based ou that idea. Probably no one man until now has accomplished so much in that direction as the late Balfour Stewart. Professor Bigelow has, however, made distinct advances upon the work of his illustrious English predecessor, and has adopted new methods of inquiry.

He argues with considerable claim to scientific accuracy that the earth is immersed in a magnetic field, whose lines of force come in from space perpendicularly to the earth's orbit. He does not here trace those lines back to their origin. He merely shows their existence and direction, and that the influence thus revealed has a distinctly measurable intensity. But he has elsewhere giveu reasons for believing that this "polar" field, as distinguished from the "radiant" field, proceeds from the polar regions of the sun, his most forcible aud original evidence on that point being a periodicity in the behavior of his polar magnetic field corresponding to the sun's rotation period. The lines of force proceed from one pole of a magnct to the other along curved lines. If the magnet be a sphere, instead of a bar, the lines will take substantially such a course as those emanating from the top and bottom of the larger circle in the first of his accompanying illustrations; and they would impiuge on another sphere, situated relatively thereto as the earth is to the sun, subject to some refraction if that second body be, like the earth, a magnet.

The exact amount of such refraction depends upon the material and condition of the interior of the immersed sphere, and laboratory experiments made by the authorities in that branch of science have established mathematical formulæ applicable in such problems.

Professor Bigelow has taken the records of magnetic observations at twenty-six different stations, made suitable corrections for temperature, eliminated other sources of error, put the data through mathematical transformations that would render those for one station comparable with those for another, and taken out of these figures the amount representiug the earth's permanent magnetism and the well-known diurnal and annual deflecting forces. He theu has left residuals, indicating the existeuce of an additional influence. Upon a semi-circle, representing a single meridian of longitude, he marks off points corresponding to the latitude of his twenty-six stations, and then draws from each point a line which shall indicate by its length the total force and by its angle the direction, in a vertical north and south plane, of the mean of his recently discovered extraneous influence. These lines had been fouud to point almost due north or south. Those on the right-hand half of his diagram are merely duplicates of those on the left; but the fact that, so arranged on a single meridian, they fall into a symmetrical system, is to his mind conclusive evidence of the existence of the earth's being immersed in a magnetic field.

The angle at which these lines strike the earth enables one to compute the amount of refraction which they will undergo after penetrating the earth. Professor Bigelow is led to conclude that the interior of the earth is non-magnetic, and only the outer layers are permeable—in other words, that our globe is a magnetic shell.

A New Electric Pen.

Those who have a fancy for seeing a telegram in the actual handwriting of the distant sender can be gratified by having recourse to the telautograph. This instrument reproduces the message exactly as it is written by means of a stylus electrically connected with the sending instrument. An electric pen, working on an entirely different principle, and intended for autographic duplication, is now exhibited. The pen cousists of a holder bearing copper wires, which are connected at the end by a small loop of steel wire. An electric current, which is passed through the pen from a small, dry cell, warms the steel loop to a temperature somewhat above the fusing point of wax. The pen being then applied to a thin sheet of porous Japanese paper covered with wax, melts the wax as it transverses the surface, and the sheet is thus made into a stencil open for the transmission of ink. The stencil sheet is fixed in a frame, and from it copies of the original writing may be taken to practically an uulimited extent, with an inking roller in the usual way. Lines of any thickness may be made without impairing the reproducing power of the stencil. The iuvention is not like so many having a similar purpose in view, confiued to letter copying, but may be used for illustrations of all kinds. The whole apparatus is contained in a small, compact box.

Electricity from Coal.

A new electric battery has been devised by Dr. Borchers, of Driesburg, iu Germany, its chemical peculiarity being that the current is generated, not by the solution of metal but by the conversion of hydrocarbons and carbonic oxide into carbonic acid. As this is practically the same reaction that takes place in burning cool, the useful energy derived from the oxidation of a given weight of carbon in the battery can be indirectly compared with the effect of burning coals or coal gas to drive a steam engine, or in a gas eugine. A steam engiue utilizes about 18 per cent of the theoretical energy produced by the oxidation in the boiler furnaces of the coal used to drive it, and a good gas engine about 25 per cent, while Borcher's battery is said to have delivered at times, in available form, 38 per cent of the energy liberated by the consumption of carbon in it, and at no time to have delivered less than 26 per cent. Enthusiastic admirers of the new battery claim it will not be long before steam boilers are abandoned and power derived entirely from batteries and distributed through wires and electric motors, but the cold requirements of practice do not lend much hope to what is still a fanciful theory.

Mechanical Progress.

Barring Engines.

In the early days of factory engines the single-beam engine was the sole motive power, and it frequently happened that the crank would stop upon the dead point. For this it was necessary to find a means for starting the engine, and for such engines as then employed it was sufficient to place a rack upon the wall behind the fly wheel and use a crowbar, bearing upon the arms of the wheel, and with its point in the rack.

When toothed rims took the place of the fly wheel there were usually a pair of eugines, and these would start from any position, and the bar became unnecessary, except for occasions when repairs were in progress and a slight movement of the engine was needed. For that purpose a rest was fixed on the floor close up to the spur wheel, and the teeth of this were used as the point of application of the bar.

With the advent of ropes for main driving and the progressive increase in the size and power of engines, the power of one man to turn them became insufficient, especially where, as often happened, many of the machine bands had been left on the working pulley, for many of the workers will always insist upon getting the maximum of revolutions out of the machines and are thus apt to leave belts in positiou. The frequent employment of the single engine again, which is found to give perfectly steady turning effort with the aid of the large fly-wheel rims now employed, demands some means of turuing the crank off the dead point, and the demand was strengthenod still more by the necessity of something to turn even the double engine when new ropes were being put on.

All these considerations led to the employment of barring engines, so arranged as to gear with an internal toothed rim, carried inside of the large rope pulley. When the small engine revolves it drives this large pulley round through the medium of a pinion, which gears in the above internal spur, and of a worm gear, the worm being on the shaft of the small engine.—William H. Booth in Cassier's Magazine for September.

Calcium Carbide.

Dr. E. G. Love, in an article on "Acetylene as an Enricher," in the *American Gas Light Journal*, says: "Theoretically a pound of pure carbide will give 5.91 cubic feet of acetylene.

"I see no reason why the carbide, when furnished in large quantities, cannot be expected to yield five feet per pound, or 10,000 feet per ton." The European papers have been talking adout acetylene for some time past, and Vivian B. Lewis, in a lecture at Edinburg, Scotland, said: "This acetylene generated by acting upou the carbide with water is practically pure, and samples made with merely ordinary precautions give, on analysis, upward of ninety-eight per cent of pure hydrocarbon."

Acetylene has a very peculiar odor, somewhat resembling that of garlic. When a light is applied to acetylene it burns with a luminous and very smoky flame; if air is mixed with it it burns with a red flame and gives off smoke in large quantities. In the proportion of one of acetylene to one and one-fourth of air the mixture is slightly explosive, but a mixture of one of acetylene with twenty volumes of air is non-explosive. When burned with the lava tips it is smokeless.

It was said in a paper read before the Franklin Institute that the carbide could be supplied for $5 per ton. If that is the case, and 10,000 feet of acetylene can be made from it, it would put the price of the gas down to fifty cents per 1000 feet, or one-third of the price now charged by ordinary coal gas companies.

Cheap Steam Navigation.

As indicating the great economy of steam navigation on the Great Lakes, it is interesting to take from the *Marine Review* some figures obtained by a party of students through tests made without preparation upon a lake steamer on its usual trip. The Rappahannock is a wooden screw steamer for carrying freight, and had a cargo of 2400 net tons (80,000 bushels) of wheat from Duluth. The draft was 14 feet 4½ inches, or but little more than the intended depth of the canals on the St. Lawrence route to tide-water and Europe. The mean speed of the Rappahannock was by the log 12.75 miles per hour, which is a fast average for a freight boat. The coal used was ordinary run of mine, costing about $2 per ton at Lake Erie ports. The boiler and machinery tests showed that the cost of fuel was one cent per ton of cargo for 157 miles' run. This is equivalent to carrying one ton one mile for 63-100 of a mill at the recorded speed of 12.75 miles per hour. Of course, to this fuel cost must be added all other expenses for the crew, for dock charges, for depreciation aud repairs, for interest on capital, and the like, before the real cost of transportation could be found; but the low cost of propulsion—one of the most important factors—is remarkable.

One recent commercial fact leads an English exchange to make some pointed comment. It is the shipment of a thousand tons of steel billets from Ohio to England. If any one had predicted twenty years ago that England would be importing steel, he would have been regarded as insane; but here is the actual fact of a large shipment of American steel to England, and that while our own iron and steel industry has suffered a great decline. Few English people have any conception of the immense development of the iron and steel industry in the United States. There is, of course, unlimited raw material and the vastest and most efficient machinery in the world. The result has been a great decline in price, the Pittsburg price for steel rails having been $40 in 1873 and only $22 per ton in 1891-95. The prices of pig iron have shown a similar fall. The exchange referred to says: "The honest truth is that we shall have to make up our minds to a loss of commercial supremacy in the near future to the United States in many important staple industries."

How gas is to be made to light itself is the question which is now reported to have been solved. The invention is simple. The self-lighting gas burner is simply an ordinary gas burner with a small tube at the side. This is screwed into the bracket or other fitting, the gas is turned on, and in from six to ten seconds the gas lights itself. This is how it is done: The gas in issuing from the burner passes over a small knob of porous material impregnated with a rare and indestructible metal, which, as soon as the gas passes over it, becomes red hot; this red heat is communicated to a small piece of platinum wire, which immediately becomes incandescent and lights the gas. This little black knob is practically indestructible, as is also the platinum wire. Therefore, as long as the burner exists, the gas on being turned on will light itself. The burner and lighter is of the ordinary size, and is made to fit any existing fitting.

The waste heat in the blacksmith's forge is now utilized in pumping the bellows. A small water-tube boiler sits just over the firebox and an engine of the simplest form attends to driving the bellows.

Electrical Progress.

Electric Power Transmission.

H. P. Livermore, general manager Sacramento Power and Light Company, has received the following letter:

DEAR SIR:—In answer to your letter of June 26th, relative to electrical transmission of power at our works, I would say:

We first introduced electric power in 1890, when we rebuilt our erecting shop, where we put in two 100-ton Sellers electrical traveling cranes and four Gib cranes of various capacities. At first we had trouble with motors burning out, but soon overcame that, and these cranes have given us the greatest satisfaction since.

The next building to be remodeled was our wheel shop. This shop required heavy line shafting, which of course prevented the use of traveling cranes. This was a cause for serious objection, and was one of our main reasons for using electricity. Since this shop was completed our experience with the motor system has far exceeded our expectation.

We have about twenty-five motors, each running its own tool, aggregating from 350 to 400-horse power, driven by a 100-horse power generator (Westinghouse), which is never overloaded, although all of the machines may be running at once. This is proof that only as much electricity is generated and used as is needed to do the work, and it is because there is no time that all of the machines are working to their full capacity together that we are enabled to couple as many motors or horse power to this small-size generator, comparatively speaking.

We calculate that we save 30 or 40 per cent of power in this shop by doing away with line shafting and heavy belts. Our method of connecting the motors to machines is extremely simple, and is our own idea. We prefer the use of belt connections because it gives elasticity; because there is less power lost in transmitting than by the use of gears, and we are able to keep the cone pulleys for variable speeds, which is far more satisfactory than by using a controller which, at best, will not give over two and one-half times the initial speed, or a rheostat system. Our belts are very short, to be sure, but we experience little or no trouble on this account.

The saving in this shop is enormous over our old methods, because we can now use a traveling crane, and two men can load a pair of wheels on a machine in five minutes, where before it took ten men thirty minutes, and indirectly this is all due to the use of electricity, because otherwise we must have held on to our line shaft and belts, and consequently could have no traveling crane.

We are now putting in a 250-horse power Westinghouse direct-connected engine and generator, and it is our intention to run our frame shop and two large machine shops by electric power within the next four months.

On the first floor we will follow out precisely the same method as described, namely, traveling cranes and motors for individual machines. On the other two floors we will keep the line shaft, but divide it into several sections, say of twenty-horse power each. This is an advantage where there is any hurried work and you may wish to run one or two machines overtime. Hoping that this information may aid you, I remain very truly yours,

BURNHAM, WILLIAMS & CO.,
Baldwin Locomotive Works.
S. M. VENELAIN, Sup't.
Philadelphia, July 3, '95.

Aluminum by Electrolysis.

One of the first uses to which the current generated at the large Niagara Falls electric plant has been put is the manufacture of aluminum from bauxite by electrolysis. What the value of such a source of electric current may be to factories in the neighborhood of Niagara, to say nothing of those at a distance, is suggested by the fact that, although the present aluminum works are constructed to produce 5000 pounds of pure aluminum a day, the complete success of the electrolytic process has convinced the management that the doubling of the resources of the factory by its means is comparatively a simple matter. More pots are to be put in as rapidly as possible until 10,000 pounds of the pure metal, worth in small quantities 50 cents a pound, is being turned out daily. The process is described as follows:

Pots containing oxide of aluminum, or alumina, which is to be changed into pure aluminum, are arranged in long rows in a large reduction room. Each pot is lined with carbon, the lining forming the negative electrode in the process of reduction. The positive pole consists of a row of copper rods, terminating in a huge carbon anode, which extends into the pot. The oxide, in a pulverized state, looking very much like flour, is placed in the pot, the carbon anodes extending through the mass, and the current carried by great copper rods through the entire length of the rows of pots is turned on. The electricity is allowed to do its work for twenty-four hours, after which the pure aluminum is drawn out and cast into ingots. By the new process the aluminum, which is separated from the ore by the action of the electricity, and the fluxes used to facilitate melting, accumulate about the negative electrode, which in this case is the carbon-lined bottom of the pot. The ingenuity of this arrangement is evident. The tremendous current heats the carbon of both the lining and the anodes to the point of whiteness, and the melting of the ore by this heat is an important factor in the manufacture of the metal. As it is ladled from the pots, it looks like ordinary lead heated to a red heat, but when poured into the moulds it glistens with almost snow-like whiteness, and the roughly cast ingots thus produced have the luster of polished silver.

Long Distance Lines.

There are a great many phenomena in ordinary electrical work that electricians find it hard to explain; but an entirely novel class of electrical demonstrations have been observed in the new practice of transmitting currents over long distances at high voltages. On the circuits of the San Antonio canyon transmission, southern California, where current is sent about fifteen miles to Pomona, and about thirty miles to San Bernardino, the line has been found, during hot, dry and cloudless weather, to be heavily charged by the mere wind; and the rate in which the line was electrified in this way was actually governed by the speed at which the wind was blowing. It was also noted that the substances blown against the trees at such times—dust, etc.—gave up their charges to it also. When the high tension current reaches the distributing stations at Pomona and San Bernardino its 10,000 volts are passed through a transformer, and reduced to such a pressure as can be safely passed along the town circuits for lighting and power purposes. In effecting this change, the transformers give forth a continuous hum, which depends for its intensity on the number of alternations of the current. This forms an excellent indicator for the attendant, whose attention is instantly called to any change in the running conditions of the plant by the resulting change of tone. This variation in the sound from the transformers not only marks changes that are taking place and that can be detected on the voltmeter, but also gives notice of coming changes before there is any other indication of them. One afternoon a painful shock was obtained on touching the line at the canon end, drifting clouds and a strong wind being noticed in the valley. Again, while the engineer was using the telephone, he heard it in a report which was so sharp as to cause momentary deafness. Later, after a moderate wind had been blowing for some time, loud reports were noticed on the telephone at long intervals. As the wind rose the reports came oftener. It was evident that there was a discharge from the lines through the telephone (which was on a metallic circuit), and that it depended on the rate the wind blew.

The Alternating Current in Motor Work.

Till recently the alternating current could not be successfully used for motor work. The only motors available were of the synchronous type, so called because they run at the same speed or in a certain proportion to the speed of the generator. When operated on single-phase circuits they are not self-starting but must be brought up to their normal speed by an independent source of power. The load is then carefully applied by a friction clutch. If the work to be done is for a moment in excess of the capacity of the motor, they get out of step, as it is called, and stop. They require a separate machine as an exciter to energize the field. It will thus be seen that their use for general power purposes is limited. By the introduction of what is known as the multiphase systems all difficulties have been overcome, and alternating current motors are now manufactured which are equal to the best direct-current motors in efficiency and starting torque, and which have the additional advantage of having no commutator or moving contacts of any kind. The three-phase system, which has so far been more generally adopted than its rival, the two-phase, may be best described as a combination of three separate alternating currents in which the reversal occurs at different times. The result is that the impulses which produce the rotation are at no time entirely interrupted.

ELECTRICITY now enters more or less into the preparation of what we eat, drink and wear, and there are many articles of utility now produced by its aid. The residents of many cities in the United States have their houses protected, lighted and heated by electricity. They go to their places of business in cars run by electricity, the elevator by which they reach their office in high buildings, or the machinery in their factory, is run by electricity. The bell which summons them to church is rung by electricity and the church organ is played by electricity. Electricity brings the news to them from all parts of the earth; stamps their letters, automatically sounds the alarm in case of fire, rings the door bell, cooks the food, and fans them while eating it. When they go to the dentist their teeth are drilled and filled by electricity, and miniature electric lamps are now constructed for the use of doctors in diagnosing diseases. The patient swallows a lighted lamp, which illuminates his person so as to enable the physician to make a correct diagnosis. The barber cuts or singes the hair by means of electricity, the streets are lighted and the farm cultivated by it. By means of it we can talk with our friends 500 or 1000 miles away and hear their voices as distinctly as though they were in the same room. The telephone is perhaps in more general use in this country than electric lighting. Even in small towns telephones form a part of the furniture of many private houses, and are used to transmit orders to the butcher, baker, etc. There are now some 85 electric railways in the United States and 9000 miles of track, employing 23,000 cars. With the aid of electricity natural forces which have heretofore run to waste are being turned to the service of mankind. The American river has already been made to furnish motor power by which Sacramento is lighted, and by which its street cars and factories are run, and new projects are in progress all over the State.

Practical Information.

Cheap Coal.

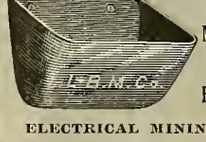
It now begins to look as if California, instead of being a State where fuel is very expensive, and manufacturing difficult, would soon be in the front rank of States which enjoy cheap fuel. Apart from the rapidly developing oil industry, there are a dozen large schemes on foot for the development of electric power from water in the mountains. This, apparently, is not very encouraging to coal producers, yet a big enterprise is being developed in the central part of the State for the supply of cheap coal to that section. For some time past work has been going on quietly on a standard-gauge railroad from the city of Stockton to coal mines at Corral Hollow, which are located about forty-eight miles from that city, in Alameda and San Joaquin counties. There are already over ten thousand feet of tunnels and crosscuts, and the owners are now preparing to take out coal. The amount in sight has been estimated at sixty million tons. The product of the mine is described as a glossy black coal, containing no sulphur. From twelve to fifteen hundred men will be put to work as soon as mining begins, with which force it is said that about fifteen hundred tons can be extracted daily, which will be sold at from $3 to $3.50 per ton. This is likely to exclude Oregon, British Columbia, Australian and other coal in a territory that consumes about five thousand tons a day.

IT may be that before long, says the *Enticelle Electrique*, glucinium will come to assume a genuine importance in the electric industry. Of the atomic weight, 9.1, and epiderfic weight, 2, the resistance of traction of glucinium is no greater than that of iron, and its conductivity is equivalent to that of silver. This metal is therefore mechanically more resistant than iron, a better conductor than copper, and besides is lighter than aluminum. If all these data are verified by experiment, there is no doubt that glucinium will soon be employed in electricity, and the more so in that its market value will be about $20 a pound, which is very much less than the same volume of platinum or the same weight of the latter metal.

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References:

Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.
Edward M. Preston, President Citizens' Bank of Nevada City, California.

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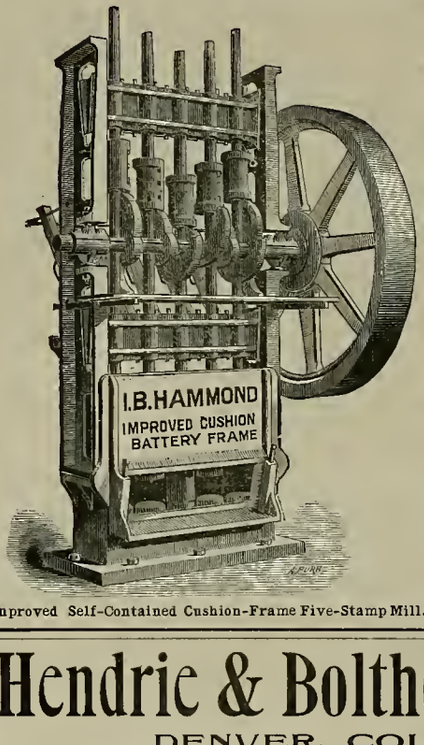
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THIRD: The Large Amount of Space Saved.

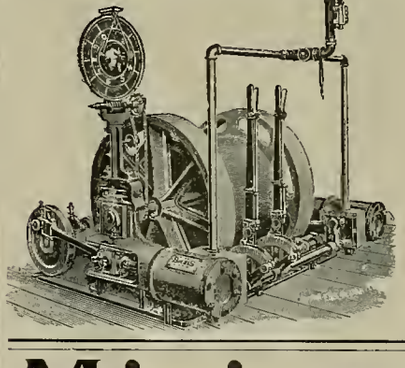
We refer by permission to Mr. N. A. McMillan, Haines, Oregon, manager of the Blue Mountain Mining Co., at Rock Creek, Or., where ten of our stamp mills are in operation; also to Mr. John S. Miller, Helena, Montana, manager of the Diamond Hill Mining Co., operating one of our forty-stamp mills at their mines at Townsend, Montana.

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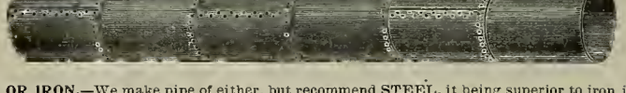
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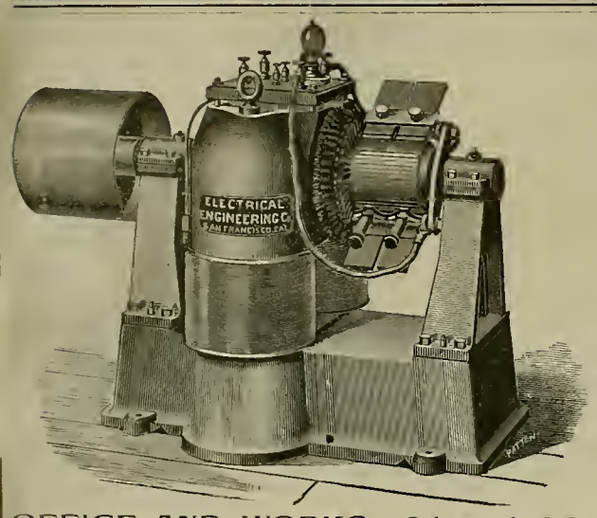
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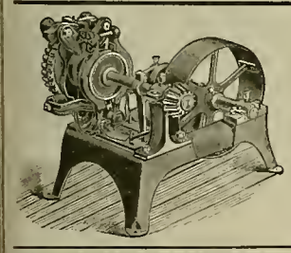
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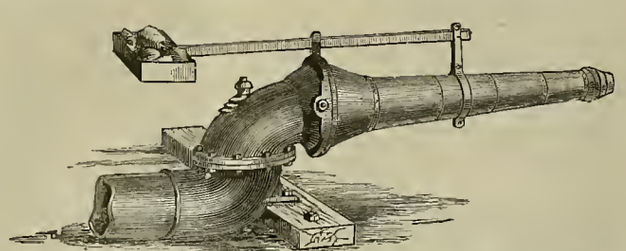
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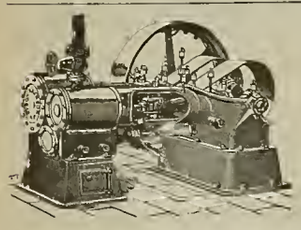


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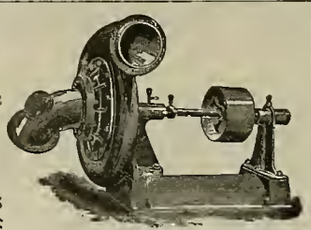
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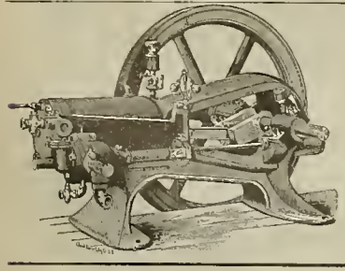
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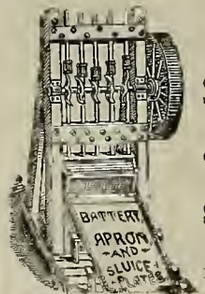


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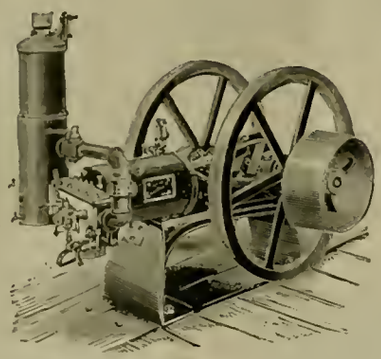
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Coal Gas, ten hours' run, 1000 feet	$2 00
Gasoline (74 deg.), ten hours' run, 8¾ gallons @ 14c	1 25
Coal Oil, ten hours' run, 7½ gallons @ 10c	75
Crude Petroleum, asphaltum base, 16 gallons @ 3c	48
Crude Petroleum (36 deg.), paraffine base, 13 gallons @ 5c	65

On the crude petroleum with asphaltum base we had an over-product of 7 gallons of asphaltum; the market price is 3 cents per gallon—21 cents. This deducted from the first cost of the crude petroleum for ten hours' run leaves a net balance of 27 cents. And from the crude oil with a paraffine base we had an over-product of 3 gallons of good lubricating oil, which we consider equal to any we have ever used, but will estimate its value conservatively at 20 cents per gallon, making 60 cents; this deducted from the first cost of the crude oil leaves a balance of 5 cents, total cost of running ten hours.

It will be readily seen that the operation of these Engines with crude petroleum reduces the cost of operation to a minimum. Crude petroleum with paraffine base at 1-10c per horse power per hour; on crude petroleum, asphaltum base, ¼c per horse power per hour; on domestic coal oil, 1½c per horse power per hour; and on gasoline, 2¼c per horse power per hour.

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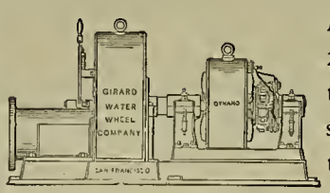
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SAN FRANCISCO, CAL.

Market Reports.

The Markets.

SAN FRANCISCO, Sept. 19. 1895.

Iron, steel and copper are buoyant in price and active in demand. Copper, by reason of the great demand in electrical lines, is especially strong. Silver barely fluctuates, holding at the 67 mark. An amusing statement is gravely made in a leading financial paper that Eastern jewelry manufacturers "have advanced the price of all their silver goods ten per cent, because of the decreased production of silver."

Bradstreets says: "Old rails and scrap have advanced $1 to $2 per tou the past week, with large sales, including a considerable tonnage to go west."

Bessemer ore from Lake Superior districts is practically out of the market.

The *Iron Age* reports that pig-iron production on September 1st amounted to 194,029 tons weekly, as compared with 180,524 tons on August 1st, with 151,113 tons on Septemher 1, 1894, and 83,434 tons on Septemher 1. 1893. Further than this, more furnaces have blown in since the 1st inst., so that "we are now getting on at a rapid rate to the 200,000-ton mark for weekly output, and are now making more iron than ever in our history, or that of any other country. Production is still increasing, and yet seems unable to keep up with the demand in certain branches."

The Steel Rail Manufacturers' Association at New York named $28 per ton f. o. h. Eastern mills as the price at which they are prepared to transact business in rails of forty-five-pound or heavier sections. This is an advance of $4 per ton.

New York Metal Market.

NEW YORK, Sept. 19.—PIG IRON—Southeru, 11.50@14.50; Northern, 12@14.

COPPER — Brokers', 12.20 @ 12.25c; exchange, 12.20@12.25c.

LEAD—Brokers', $3.25; exchange, $3.37½.

TIN—Straits, 14.40@14.55c.

SPELTER—Domestic, $4.30.

New York Silver Prices.

NEW YORK, Sept. 19.—Following are the closing prices for the week:

	Silver in—			
	London.	*N. Y.*	*Copper.*	*Lead.*
Friday	30½	66⅞	12 25	.....
Saturday	30⅝	66⅞	12 25	3 25
Monday	30⅝	66⅞	.....	3 25
Tuesday	30½	67	.....	.....
Wednesday	30⅝	66⅞	12 25	3 25
Thursday	30¾	67	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.89
London Merchants	$4.87½
London Sight Bankers	$4.90
Refined Silver, per ounce	67c
Mexican Dollars, nominal	54½c

San Francisco Metal Market.

COPPER.			
Bolt	¼ & 5-16, 19c; ⅜ and larger, 19c		
Lake Superior Sheathing	21	@	—
Ingot, jobbing	—	@	17
Ingot, wholesale	16	@	15
Sheet copper	—	@	20
ZINC.			
Sheet	9	@	
LEAD.			
Pig	—	@	4 00
Bar	—	@	4 10
Sheet	—	@	5 35
Pipe	—	@	4 85
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do. " "			1 45
IRON.			
American Soft	15 00	@	17 00
Pig, per ton	16 00	@	19 00
STEEL.			
English, lb	15	@	17
ANTIMONY.			
Per lb	—	@	10
PIG TIN.			
Per lb	15	@	16 00
QUICKSILVER.			
Home trade, per flask	41 00	@	— —
TIN PLATE.			
Per bx	5 25	@	6 00
ZINC.			
Sheet	8¼	@	
BORAX.			
Refined, in car lots	—	@	5⅛
Refined, in sacks and barrels	—	@	5⅜
Powdered, in car lots	—	@	5⅝
Concentrated, "	—	@	4⅞
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 50
Greta			7 50
Nanaimo			7 00
Gilman			6 50
Seattle			7 00
Coos Bay			5 50
Cannel			8 50
Egg, hard			13 00
Wallsend			7 50
Scotch Splint			8 00
Brymbo			8 00
TO ARRIVE—CARGO LOTS.			
Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'		75c	₱ bbl
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —
NAILS.			
Wire			$2 50
Cut			2 25
LUMBER.			
SAN FRANCISCO — WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, September 19, 1895.

There was continued activity the past week in the shares of the Gold Hill group of mines, with Confidence and Challenge the leaders. The former started at $2.00 and advanced to $2.50 and then fell back to $2.15, from which figure it moved up to $2.75 and then sold down to $2.60. Challenge started at 77 cents and moved up to 93 cents, then set back to 83 cents from which figure it made a quick move to 99 cents and then down to 93 cents. In the latter, Yellow Jacket sympathized the most, going up to 59 cents. The other Gold Hill shares moved more sluggishly. Shares in the middle and north-end groups, outside of Andes, did very little. The latter sold up to 53 cents. The trading seem to have little confidence in the market, particularly owing to Con. Virginia keeping back. For several years the shares in this mine have been the pivot on which the market hinged, and its eratic moves are more apt to create distrust than inspire confidence. In outside shares there is very little life, although Bodie more than carried its assessment and holds fairly steady at the advance.

The news from the Comstock mines is of an encouraging character. From one end to the other the work under way is of an important character. Much of this is necessarily of a preparatory nature, which, when completed, will be followed by energetic work in directions calculated to strike ore. This has particular reference to the mines in the north-end and middle groups. In the Gold Hillers the work seems to he towards the west, so as to strike the west lode found iu Confidence. In the latter they have run a crosscut to find the width of the veins, and reports state that it is over twenty-five feet wide, with an average assay value of from $50 to $65 a ton, mostly gold. It is stated that drifting either in the ore or alongside of it will soon he started, so as to open up the Challenge ground. When this is done it is probahle the drift will be run into Con. Imperial ground, to make connection with the west cross-drift that is heing run by the latter. This would give splendid air connection. It is reported on the street that Alpha has struck the west lode, hut as yet official letters have not verified the rumor. If the lode has not been struck it will be before long, provided the west workings are not discontinued. In Crown Point and Kentuck preparatory work is heing done to push for the west lode. Owing to a fall of water in Carson river the extracting of ore by the former company has been suspended, hut other work has not been stopped. Belcher, Overman and Seg. Belcher are taking out a few tons of ore each week as exploiting work is pushed. As Yellow Jacket is incorporated under the laws of Nevada very little information is allowed to leak out regarding the work heing done. In Con. Virginia good progress is heing done to open up the 1100 and 1000-foot levels. While this is under way, work is not neglected on the lower levels. It would seem from official advices that Andes is preparing to take out ore, provided it is found in sufficient quantities. In the other north-end mines and also the middle group the character of the work is essentially unchanged from that reported some time past.

Work on the Brunswick lode does not attract attention since the movement in the Gold Hill shares, but if expectations should be realized after active exploiting work is under way, it is reasonable to expect more activity in the shares of the mines controlling ground on this lode. Preparatory work is still the order in all except Occidental. It will probably take several weeks before they will he in position to drift for ore. In Occidental more or less exploiting is under way, hut as yet nothing has developed of an important character.

The market opened yesterday strong for the Gold Hillers and steady for the middle and north-end shares. Under strong huying Confidence sold up to $3.10 and Cballenge to $1.10 after the regular call. Crown Point, Yellow Jacket and Belcher, and others in the Gold Hill group, advanced slightly. The rest of the list were stronger but did not move up much outside of Savage, which sold higher owing to reports of new work to he started soon.

The following illustrates the changes of the week:

MINES.	Sept. 12	Sept. 19
Alpha	$ 17	$ 19
Alta Consolidated	11	.....
Andes	34	52
Belcher	58	70
Best & Belcher	1 10	1 15
Bodie	14	39
Bullion	20	21
Challenge	92	1 05
Chollar	61	61
Confidence	2 15	3 10
Consolidated California and Virginia	2 85	2 75
Consolidated New York	.....	.....
Crown Point	53	58
Exchequer	04	07
Gould & Curry	56	58
Hale & Norcross	1 70	1 60
Justice	08	.....
Mexican	72	77
Ophir	1 70	1 75
Overman	20	21
Potosi	63	64
Savage	40	47
Sierra Nevada	95	91
Union	64	68
Utah	10	.....
Yellow Jacket	45	62

WANTED!

A Gold Quartz or Copper Property,

With sufficient development work done to show up the property. Must stand a thorough and complete examination. None but a first-class property wanted. All information will be strictly confidential with buyer only. Send full particulars of property for sale.

M. KNOX,

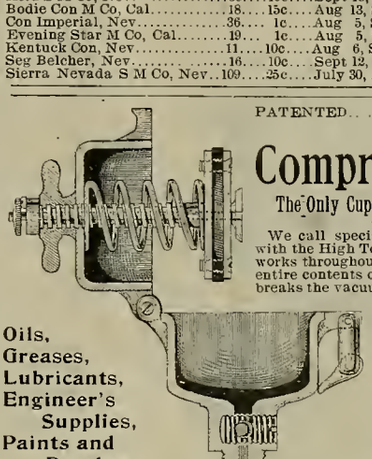
12 Front Street.....San Francisco, Cal.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	*No.*	*Amt.*	*Levied, Deling't and Sale.*	*Secretary.*
Alta S M Co, Nev	50	10c	Sept 16, Oct 21, Nov 11	J E Jacobus, 309 Montgomery
Bodie Con M Co, Cal	18	15c	Aug 13, Sep 16, Oct 7	M E Willis, 309 Montgomery
Con Imperial, Nev	36	1c	Aug 5, Sept 12, Oct 3	C L McCoy, Mills Building
Evening Star M Co, Cal	19	1c	Aug 5, Sept 10, Sept 23	J J Scoville, 320 Sansome
Kentuck Con, Nev	11	10c	Aug 6, Sept 10, Oct 1	Aug Waterman, 309 Montgomery
Seg Belcher, Nev	16	10c	Sept 12, Oct 15, Nov 4	E B Holmes, 309 Montgomery
Sierra Nevada S M Co, Nev	109	25c	July 30, Aug 30, Sept 23	E L Parker, 309 Montgomery



PATENTED.....No. 507,409

BOYD'S

Compression Grease Cup.

The Only Cup in the Market that will give Perfect Satisfaction.

We call special attention to the Strength of the Cup, together with the High Top, which permits the use of a powerful spring that works throughout its full extension, thus ensuring the feeding of the entire contents of the Cup. Also to the Automatic Air Valve, which breaks the vacuum underneath the plunger and thus enables the Cup to be opened at any stage of the feeding without exertiou or sucking back the grease or compound from the bearing. This is the only effective device for this purpose ever applied to a Cup. These cups are manufactured in several designs and sizes, suitable for various purposes. For Journals the screw top lever is ordinarily used, and can be furnised with Spring pressure or with Screw pressure without a spring; both forms, however, have the Automatic Air Valve. For loose pulleys a specially fastened hinge Cup with Automatic Air Valve is made, as shown in the cut.

Oils, Greases, Lubricants, Engineer's Supplies, Paints and Brushes.

AMERICAN OIL CO.,

14 Main Street.....San Francisco.

San Francisco Stock Board Sales.

SAN FRANCISCO, Sept. 19, 1895.

9:30 A. M. SESSION.

600	Alpha	18	200	Mexican	73
300	Andes	52	100		74
300		51	600	Mono	15
100	Belcher	70	300	Occidental	25
300	Best & Belcher	1 10	350	Ophir	1 70
100	Caledonia	15	750	Overman	20
400		16	1100	Potosi	64
750	Challenge	1 00	900		65
200	Confidence	2 75	100	Savage	45
50		2 80	350		46
200	Con Cal & Va	2 75	500	Scorpion	04
100	Crown Point	57	100	S B & M	10
200		58	200	Sierra Nevada	91
500	Exchequer	05	100	Union	65
200	Gould & Curry	56	750	Yellow Jacket	60
1000	Julia	02	100		61
200	Kentuck	15	20		62

SECOND SESSION—2:30 P. M.

50	Alpha Con	19	200	Gould & Curry	58
100	Andes	51	400	Hale & Norcross	1 60
200	Belcher	69	20		1 55
100	Best & Belcher	1 15	500	Julia	02
200	Bodie	39	100	Mexican	77
100	Bullion	21	100	Occidental	23
200	Caledonia	15	500	Ophir	1 75
300	Challenge	1 05	400	Overman	24
100	Chollar	61	100	Savage	47
3000	Con. Imperial	01	100		46
200	Confidence	3 10	200	Sierra Nevada	97
100	Crown Point	58	50	Union	68
100		59	100	Yellow Jacket	60
500	Exchequer	07			

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(Successors to THOMSON & EVANS.)

110 & 112 BEALE STREET, S. F

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Steam Pumps. ✦ Steam Engines.

. . . *All Kinds of MACHINERY.* . . .



DEEP WELL PUMPS!

AMERICAN CONDENSED MILK COMPANY

WESTERN AMERICAN 99 BRANDS

SAN FRANCISCO

WANTED!

A PRACTICAL PLACER MINER,

Capable of taking charge of hydraulic plant.

Address, stating salary expected, TEMPLE BAR, Kingman, Arizona.

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Second Edition. Completely Revised.

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PRICE, BOUND IN CLOTH, $5.00

Hydraulic Mine for Sale.

Not on a navigable stream; in northern California. Good dump; no trouble with tailings; 180 acres of mining ground; 5000 inches of water. Can work eight months in the year. Ample opportunity given a buyer to fully test the property before payment is made. For further details,

Address X, 2022 W St., Sacramento, Cal.

Assessment Notices.

FAIRFAX VILLA COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Fairfax, Marin County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of August, 1895, an assessment, No. 4, of Fifty Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 56, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of September, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 21st day of October, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, Room No. 56, No. 309 Montgomery street, San Francisco, California.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 23d day of August, 1895, an assessment, No. 3, of 2½ cents per share was levied upon the whole of the capital stock of the corporation, both paid and unpaid, payable immediately in United States gold coin to the Secretary, at the office of the company, 213 Jackson Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of October, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 28th day of October, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald, Trustee	295	1,000	100 00
M. J. McDonald, Trustee	296	1,000	100 00
M. J. McDonald, Trustee	298	1,000	100 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Loiz, Trustee	457	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
Mrs. Hattie C. Baggs	529	201	20 10
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	309	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4,000	400 00
Montgomery Baggs	528	100	10 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

WANTED.—POSITION AS ASSAYER OR Amalgamator. Capable to take charge of mine and mill. Over 25 years experience.

C. S. A., 1212 So. O Street, Tacoma, Wash.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPTEMBER 10, 1895.

546,101.—CONCENTRATOR—C. E. Barling, S. F.
546,210.—CENTRIFUGAL PUMP—H. C. Behr, S. F.
546,199.—LEATHER STRETCHER—Cook & Houston, S. F.
545,877.—PIPE COUPLING—W. Curlett, S. F.
545,950.—PROPELLER—C. Eyraud, S. F.
545,952.—HANGING FERNERY—Alice Fitz-Gerald, Duarte, Cal.
546,115.—DRAWING STEAM BEER—G. A. Friedrich, S. F.
546,143.—ELECTRIC RAILWAY—H. A. Fry, Portland, Or.
546,146.—TONGUES FOR KEY OPENING CANS—J. Gould, Jr., Berkeley, Cal.
546,103.—ALARM CLOCK—E. E. Katz, San Bernardino, Cal.
546,175.—GAS GENERATOR—M. L. Mory, Chico, Cal.
546,283.—ICE CUTTING MACHINE—G. E. Milliken, Mentone, Cal.
546,079.—AMALGAMATOR—T. Pilkington, S. F.
546,080.—ROTARY MOTOR—R. Pomray, Portland, Or.
545,974.—MOLD—E. L. Ransome, Oakland, Cal.
546,249.—POWER TRANSMITTER—D. S. Regan, S. F.
546,198.—PHOTOGRAPHIC SHUTTER—Sam'l Slayton, S. F.
546,265.—METER—H. W. Williams, Seattle, Wash.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

PROCESS OF PRESERVING TIMBER.—William G. Curtis und John D. Isaacs, San Francisco, Cal. No. 545,229. Dated Aug. 27, 1895. The object of this invention is to provide an improved process for impregnating timbers with preservative fluids, and means for a more perfect preliminary drying of the timber, a thorough impregnation with the preservative fluid, and a less loss of the preservative fluid by evaporization, together with a less amount of time necessary for the completion of the process. The process also prevents the timber from checking and cracking as much as it has hitherto done under processes formerly used for the purpose.

RAILWAY VELOCIPEDE. — Max Sternberg, Crefeld, Germany. No. 545,746. Dated Sept. 3, 1895. This invention relates to that class of velocipedes especially adapted for travel along the rails of a railway and used by track walkers and others having charge of the roadbed. The main object of the inventiou is to provide n velocipede which can he quickly made to occupy hut a very small or narrow space, in order that it may he taken out of the way instantly in situations where the space is very limited, as hetween two tracks in tunnels aud narrow cuts, on hridges and trestles, and hy this capability adapt the machine for operation and use at times when it would otherwise he dangerous or inadvisable to proceed upon the road with a machine. Another object of the invention is to determine any variation in the gauge of the tracks. The machine consists essentially of an outer or halancing wheel connected with the main portion hy a joint, whereby said wheel may be turned from a horizontal or working position to a vertical position, out of the way; a curved har connected with the support of the wheel and slidably mounted in the main frame of the machine, and means for engaging said har to effect the change of position of tbe wheel. The outer or halancing wheel has a spindle slidable in the axle, adapting said wheel to move laterally with any change of gauge, and electrical devices are provided hy which this lateral movement of said wheel is adapted to sound an alarm, therehy notifying the rider of a change of gauge.

MACHINE FOR MAKING AND FITTING TONGUES OF KEY-OPENING CANS.—James Gould, Jr., Berkeley, Cal. No. 546,146. Dated Sept. 10, 1895. The object of this machine is to make and fit the small pieces of metal called tongues to the flanges of exterior tight-fitting heads of cans, wherehy the latter may he opened hy means of a key applied to the tongue, and by which the flange of the can head is torn off. The tongues may he introduced under the flanges of the heads, a portion of said tongues remaining beyond the flange, or, as is more common, they may be caused to intersect the can-head flange, and in either case the machine consists, as a whole, in means for feeding the headed cans; means for receiving and conveying them successively to position; means for holding them in position against end thrust; means for feeding a sheet of tin and cutting it into tongues; means for directing the tongue to place, pressers acting on the hody hetween the tongue and head flange edge; and means for forcing the tongue edgewise hetween the pressers and hody to its place under the can-head flange.

RUPTURE CURED!

NO DANGER. NO OPERATION. NO PAIN.
No Detention from Business.
QUICKLY! PERFECTLY! PERMANENTLY!

NO PAY UNTIL CURED.

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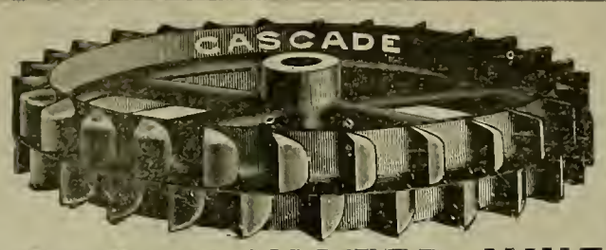
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STANDARD OF EXCELLENCE—USED IN ALL FIRST-CLASS ELECTRICAL WORK.

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Adapted to all heads, from 30 FEET TO 2000 FEET. Our experience of 33 YEARS in the water wheel business enables us to suit every requirement of water power plants. Send for illustrated pamphlet. This new wheel has given an unequaled Economy in Water.

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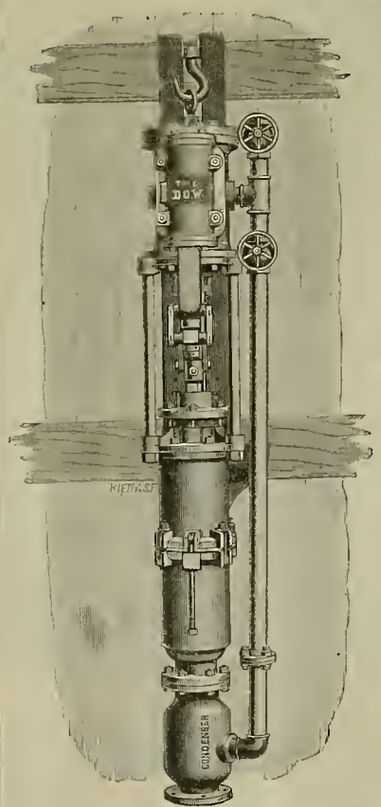
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SINGLE OR DUPLEX, FOR EVERY POSSIBLE DUTY.



MINING PUMPS,

Irrigation Pumps,

Artesian Well Engines,

Independent Air Pump and Condenser,
For tationary Engines or Steam Pumps.

Power Pumping Machinery,

Speed Governors,

BALANCE VALVES AND PRESSURE REGULATORS FOR STEAM PUMPS,

Etc., Etc.

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AARON'S LEACHING GOLD AND SILVER ORES, the most complete hand-book on the subject extant; 164 pages, octavo. Illustrated by twelve lithographic engravings and four wood cuts. Fully indexed. Plainly written for practical men. In cloth, $3. Sold by THE MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco

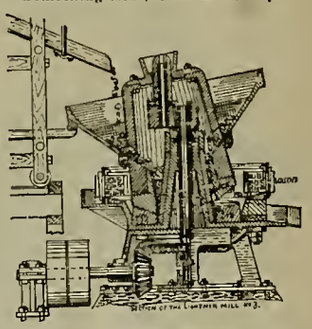
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All kinds of tools. Fortune for the driller by using our Adamantine process; can take a core. Perfected Economical Artesian Pumping Rigs to work by Steam, Air, etc. Let us help you. THE AMERICAN WELL WORKS, Aurora, Ill.; Chicago, Ill.; Dallas, Tex.



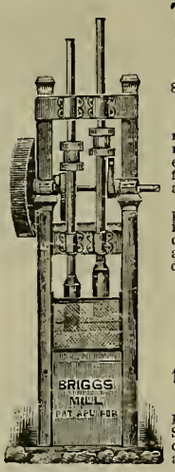
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NEWTON M. BELL, 109 California Street.

A Full Assortment of Wire Rope for Mining Purposes carried in San Francisco.

THE LIGHTNER QUARTZ MILL.
Something New, Good and Cheap.



MANUFACTURED BY
WM. H. BIRCH & CO.
Also Manufacturers of
Cary Steam Pumps, All kinds of Mining Machinery, Boilers, Engines, Ore Buckets, Ore Cars, Cages, Hoists, etc.
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The Briggs
TWO-STAMP MILL,

850-lb. stamps; weight of mill, 6000 lbs.

The most substantial mill ever offered to miners; discharges both ends and front; will crush from 6 to 10 tons per day; any one can set it up.

Complete as per cut, price $450.00. This mill is furnished with 9-inch cast steel shoes and dies, and substantial independent iron guides.

Western Manufacturing Company,
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Builders of all kinds of Saw Mill and Mining Machinery, Engines, Boilers and Special Machinery.

THE WILSON
HIGH GRADE STEEL
SHOES
—AND—
DIES.



Guaranteed to Wear Longer and Prove Cheaper than any others.

Made by use of Special Appliances.

PATENTED AUGUST 16TH, 1892.

—Made only by—

Western Forge and Rolling Mills,
ST. LOUIS, MO.

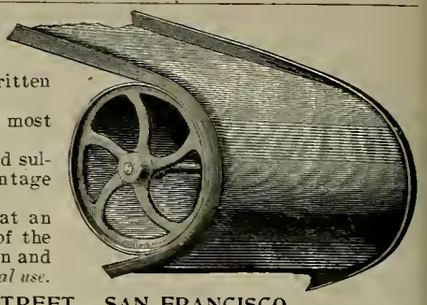
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(A CORPORATION.)

Constantly on hand a full assortment of Manila Rope, Sisal Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc. Extra sizes and lengths made to order on short notice

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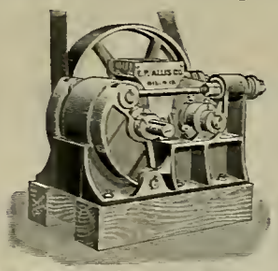
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VOLUME LXXI. Number 13. SAN FRANCISCO, SATURDAY, SEPTEMBER 28, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Alcatraz Asphalt.

In noting the mineral wealth of California and its development the PRESS in this issue brings to public attention a new industry which has recently been developed and created in this State—a manufactured product that through merit has made a market for itself in the East.

In the southern part of the State, where the shore line trends almost due east and west, and close to the ocean, lie enormous beds of asphalt which have been rudely utilized since the days of the early Spanish Mission Fathers, but of late have been acquired by a California corporation — the Alcatraz Asphalt Company — which has proceeded in a scientific manner and on an extensive scale to produce a high-grade asphalt and build up a great manufacturing business.

Trinidad asphalt has long been used for paving purposes. In its crude state it contains about forty per cent of bitumen, the remainder being clay and vegetable matter. In the refining process and when used for street work it is fluxed with residuum oil, the mixture being mechanical and consequently liable to disintegration. The California asphalt as prepared for use is a natural compound of elements that form a chemical union, making it of superior value for pavements and street work. The Alcatraz rock asphalt is a natural product, containing when mined about sixty per cent bitumen, the residue being silica, free from clay or organic matter. The Alcatraz liquid asphalt is a pure liquid bitumen, separated from the parent beds of shale by apparatus admirably designed for the purpose. The Alcatraz asphalt paving cement is a combination of these two materials, forming a perfect paving compound, elastic and permanent, not cracking nor melting, possessed of sufficient body of bitumen to withstand the wear of street traffic, and devoid of the objectionable petroleum residuum that makes the ordinary Trinidad asphalt so comparatively short-lived and unsatisfactory. The pavement on the street in front of this office—Front from Market to Pine—is a good example of what an asphalt pavement with plenty of bitumen in it will stand in the matter of heavy street traffic. Loaded trucks traverse it constantly, yet it shows little signs of wear.

W. N. Cowles, the president of the Alcatraz Asphalt Co., whose office is in the Crocker building, this city, says that the company has about 35,000 acres of this deposit on the shore in Santa Barbara county, one deposit at Las Conchas, another at La Patera, north and south respectively of the city of Santa Barbara, and about twenty-two miles apart. The process of manufacture is interesting though simple. Herewith are presented illustrations of the industry. Fig. 3 on page 200 represents men at work at the Las Conchas mine at Carpinteria, in an open cut directly in front of the refinery, the flume on the left dumping the residual sand or "tailings" into the ocean, where the tides sweep it away. The monthly output at this surface mine is about 1000 tons. Fig. 4 on page 200 is a part of the same "mine," the high bluff on the right being directly on the beach. Fig. 1 on this page shows the method of hydraulicking there, which is different from that in use in a drift or gravel mine, the process in this case being simply the washing away of loose, superimposed sand from the bitumen deposits. Fig. 2 on this page shows a different form of extracting the bituminous deposit at the other mine, at La Patera, where about 750 tons are monthly mined, 200 feet being so far the deepest level. Fig. 5 on page 200 represents the rock asphalt in a tunnel at a depth of 125 feet in the same mine. Fig. 6 on page 201 gives a view of the camp at the same mine and that part of the California coast line. Fig. 7 represents the ore dump at the mine.



FIG. 1.—HYDRAULICKING AT LAS CONCHAS MINE.



FIG. 2.—SHAFT NO. 4, LA PATERA MINE.

The company employs about 100 men, the plant being lit and operated by electricity. The asphalt when mined is carried to the refinery, where it is freed from impurity, the process making it possible to bring it to any required efficiency. It is then fluxed and prepared by the addition of a liquid asphalt extracted in the same plant but by different apparatus, to a purity of 98 per cent bitumen. When both are melted together, forming

(Continued on page 200.)

MINING AND SCIENTIFIC PRESS.

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J. F. HALLORAN.....General Manager

San Francisco, September 28, 1895.

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It is understood that Hon. J. H. Neff declines to further assume the responsibilities of the presidency of the California State Miners' Association and that W. C. Ralston has no intention of accepting the secretaryship for another year. Both gentlemen consented to serve last November only in response to the unanimous and urgent request of the convention, and feel that they have done as much as could reasonably be expected of men in giving valuable time and service to the cause, a feeling that is shared by other prominent members of the association, who will, probably, at the next convention ask to be relieved of the duties they have carried on since accepting the unsought positions. The secretary's office is the only salaried one in the association. The salary is $50 per month; the present incumbent has drawn no salary for nearly a year, and proposes to donate the amount due him to the association. His services have been of such manifest value as to render detail unnecessary. The same may be said of the honored president who has given freely of his time and money to further the aims of the association. There is no profit but some honor in worthily filling those and similar positions in the councils of the association. Could solicitation prevail it were wise to secure the consent of those gentlemen to their re-election. If they positively decline to serve, the next best thing is to see that their successors are in every respect worthy representatives of the miners. It is neither the province nor the purpose of this journal to suggest names of possible candidates, even if it were certain that those named and others in the association's councils would positively decline re-election. That is a matter for the miners themselves solely to determine. It is in order, however, to say that in this as in other things any one who persistently seeks a position and tries to "pledge" delegates to support him, does not at the start evince the possession of the qualities necessary for impartial success.

In last week's issue was printed in full the communication of the Committee on Protection to Mineral Lands, sent to Mr. W. H. Mills on the 17th. Under date of the 25th that gentleman returned the communication to the committee, and vouchsafed the information that he had only read the first paragraph, and that as he only represents the Central Pacific Railroad Co. he is unable to proceed in any negotiation that assumes representation by him of any other corporation. In this communication, written eight days after receipt at his office of the committee's communication, Mr. Mills begs to call attention to the fact that his former communication remained unanswered for 27 days. The committee promptly replied that, had Mr. Mills taken the trouble to read their communication of the 17th inst., he would see that the cause of the delay in answering his former communication was that President Neff had been placed on the committee, that his advice and co-operation were essential, that he was absent in Boston, Mass., and elsewhere in the East, not returning to his home in Auburn till the 16th, and that the following day the answer to Mr. Mills was sent, which, under the circumstances, was remarkably expeditious. Regarding Mr. Mills' statement as to any needed change in the wording of the communication of the 17th, the committee in its answer of the 25th courteously directs that gentleman's attention to the fact that he is not asked nor expected to act for any company that he is not empowered to represent, and expresses the belief that if he desired to expedite the negotiations he could have embodied his amendments in his communication. It might sound prejudiced to say that Mr. Mills was trifling with the committee; it might seem unjust to assume that he is trying to fill up the time till the Miners' Convention in diplomatic postponement of consideration of his own proposition; it might appear unfair to imply insincerity and lack of real intent on his part; but any one who did trifle with the committee, who did try to tardily use up the time of the life of the committee (which expires October 14th), and who did evince insincerity, would act in this matter in a manner very similar to the tactics so far adopted by the official representative of the landed interests of the Central Pacific Railroad Co.

Iron in California.

Though California is rich in iron ore, there is little active effort to utilize it. Extensive deposits of excellent quality exist in several parts of the State, but since the cessation of operations in Placer County there appears little incentive in even less favored localities, the matter of fuel and transportation militating largely against development. Recently it was stated that the Tepustate mine in Lower California would be worked by its owners who also control the Oswego, Oregon, iron mines, the idea being to mix the high grade Tepustate ore with the inferior northern ore. It was estimated that there were 500,000 tons of ore in sight, and arrangements were in progress for shipment, but this week it is learned that the project has been tabled. A recent analysis of the Tepustate ore gave the following contents:

Iron peroxide	89.64
Iron protoxide	5.27
Alumina	1.40
Silica	1.38
Sulphur	1.30
Phosphorus	0.32
Manganese	Trace
Lime	Trace
Metallic iron	68.85

The unusual freedom of this ore from sulphur and phosphorus makes it of manifest value in the manufacture of Bessemer steel or ferro-manganese. Los Angeles Co. possesses several valuable iron deposits, particularly one two miles from Lang, on the S. P. Ry. A recent analysis of this ore gave the following result:

Sesquioxide of iron	68.070
Protoxide of iron	23.000
Alumina	2.843
Oxide of manganese	1.750
Lime	.310
Magnesia	2.161
Phosphoric anhydride	.108
Sulphuric anhydride	.140
Silica	1.810

In the Minaret mountains, in the northeastern part of Fresno county, is an enormous deposit of hematite and magnetic iron ore. A letter regarding this ore says: "The quality, according to assays from the State Mineralogist, is unexcelled by any mine on the continent. The quantity in sight is sufficient to build a double-track railway around the globe."

An analysis of this ore from a Cleveland, Ohio, laboratory is as follows:

Iron	66.200
Silica	4.200
Phosphorus	.249
Manganese	.370
Alumina	.340
Lime	2.040
Magnesia	.022
Sulphur	.039
Organic and volatile matter	.240
Titanic acid	None.

Another hematite deposit at Los Banos, Merced Co., according to a Pittsburg assay shows 92 per cent. of ferric oxide.

Regarding "Hematite," "Magnetite," etc., it may be here parenthetically stated the following classification of iron ores from the *Iron World*, although it may be open to some technical criticism, is believed to be the best arrangement:

1. Red hematite comprises those ores in which the iron occurs as an anhydrous oxide, giving a red streak on a porcelain plate, the color of the ore being generally a brownish-red or red, although sometimes a dark gray, almost black. This class includes "red hematite," "fossil" or "Clinton" ores, "specular," "micaceous" ore, "slate" ore, etc., as well as some "martite," which is a pseudomorph after magnetite.

2. Brown hematite, which contains more water than the red hematite, is generally of a brown or yellow color, and when powdered shows a brown or brownish-yellow streak on the porcelain plate. The varieties are known as "limonite," "turgite," "pipe" ore, "bog" ore, "goethite," "oolitic" ore, etc.

3. Magnetic comprises those ores in which iron occurs as a magnetic oxide, generally black or blue-black, or occasionally steel-gray or greenish in color, and which when powdered gives a black streak on a test plate, and are attracted by a magnet. In this class is included some "martite," which is mined with magnetite.

4. Carbonate includes those iron ores which contain an excess of carbonic acid. They are generally gray, yellow, or rather buff and brown in color, and are tested by the use of hydrochloric acid. They comprise the "black band" ores, "clay ironstones," "spathic" ores, "siderite," etc.

From some mines, brown and red hematite, or red hematite and magnetite, or carbonate and brown hematite ores, are obtained out of the same workings, the extent to which ores are hydrated or weathered, transferring them from one class to another; or different classes of ore are found intermixed or alternating in the same deposit.

Chromic iron, shown by assay to contain 52 per cent chromic oxide, has been discovered on the Maillard ranch, San Geronimo township, Marin Co., about eight miles from San Rafael, and in the same locality iron and manganese are found in considerable quantities. A sample sent to the Bethlehem, Pennsylvania, Steel Works showed an assay of 46 per cent oxide of manganese, and brought an offer from that company of $30 a ton for the ore delivered at the works.

In Sonoma, Humboldt, Inyo, Placer, Napa, Tulare, Tehama, Shasta and Lake counties are also large known deposits of good iron ore.

One of the largest and in many ways the most remarkable of the iron deposits of this State or coast is in San Bernardino county, about 150 miles from Los Angeles, on the line of the Atlantic and Pacific railroad, described by Warren Wilson, who recently visited that locality. Leaving the railroad at Newberry, traveling thence six miles over a barren, level country, a narrow gorge in the mountains is reached, entering a lava bed on the northern boundary. The rocks in both walls of this place are serrated, sharp and angular, black as well as stained by the oxide of iron. The leading features of this remarkable body of ore are its vast extent, its richness and freedom from impurities, and the presence of several varieties of iron ore. The entrance of the defile is about 50 feet in width and 200 feet high, vertical in some places and in others inclined. Passing in from the entrance for about 400 feet a vast open space is reached, surrounded by rocks of the same character as those of the walls constituting the fissure or gorge. Thence in a southerly direction for five miles, volcanic rock, tufa and sandstones of volcanic materials are found. Reaching the summit, at an elevation of 3880 feet, all traces of volcanic character disappear. The rocks are granitic in character on the southern slope of the mountains and at its base, while at an altitude of 3025 feet is found the iron deposit referred to, about four miles from the summit. The veins of this deposit are well defined. They run for 20 degrees east, and dip into the hill northwest at an angle of about 30 degrees; the veins lie nearly parallel, separated by a deposit of 150 feet of syenite at a slight inclination. It is stated that the lower body of this ore is not only remarkably pure but magnetic. The upper vein of this ore lies at an altitude of 3205 feet, and in it are found hematite as well as magnetic ores, and another known as nut ore. It stretches 70 degrees

northwest, its northern wall being a regular belt of dolomite limestone, the southern wall being syenite. On these hills this vast body of iron ore averages 300 feet in width, and may be traced for a distance of three miles, with a valley intervening of about one mile in length, which has cut away the vein on the surface. It has been estimated that there are disclosed not less than 1,000,000 tons of ore. A great deal of development work has been done here, in all instances demonstrating the varied character of the veins. The work done thus far has cost about $10,000, including the expenses of patenting the claim named Bessemer No. 1.

The magnetic ore found here lies in heavy, compact masses of a deep iron color, with some luster, and with an occasional copper tint, that was at first suspected to indicate the presence of titanic acid. The iron ore is said to be highly magnetic. In several of those groups hematite predominates, such as is so largely in use in Europe for the manufacture of Bessemer, and Siemans-Martin steel, and by reason of it containing so small a quantity of phosphorus and sulphur, it would appear to be almost identical with the ores worked at Bavarian furnaces in Lancashire, England, also in the Westmoreland and Cumberland mines, and at Bilboa in Spain. Specular iron ore is also found in one or two of the claims, and spathic ore, or carbonate of iron, is also found in this remarkable group.

Concentrates.

THE Osborn Hill mine at Grass Valley has temporarily closed down.

A FIRE at Knights Ferry last Monday destroyed a large part of the town.

A $25,000 DIVIDEND is announced by the Three Forks, B. C., Concentrator Co.

A TEN-STAMP MILL is to be put up at the North Star mine, above Enterprise, Butte Co.

COLORADO MEN are examining the St. John mine, near Grass Valley, with a view to purchase.

THE new 20-stamp mill at the Mayflower, near Canada Hill, Nevada Co., started up last Tuesday.

THE Zirn mine at Pine Nut, near Carson, Nev., is reported sold for $50,000 to a New York syndicate.

THE August gold output in the Witwatersrand (South Africa) district aggregates 203,573 ounces.

AT Quesnelle Forks, B. C., the Cariboo mine is running sixteen hours a day with 2000 inches of water.

A SOUTH AFRICAN MINERS' ASSOCIATION is now proposed at Johannesburg. Next in order will be a Miners' Union.

F. DESELVE was instantly killed at La Grange, Merced Co., last Tuesday, while at work in the Speaker drift mine, by a cave.

HOLDERS of unpatented claims have 90 days left in which to perform the required $100 of work or improvements for this year.

THE annual statement of the Merced Gold Mining Co. shows capital stock $1,500,000; actually paid in, $1,000,000; existing indebtedness, $27,287.29.

THE Denver *Republican* says the cost of mining both gold and silver in Colorado now is fully 30 per cent. below the figures for 1893 before the panic.

AT Wardner, Idaho, the Last Chance mine is again in operation and is daily shipping 55 tons of ore, with a total force of eighty-two men in mine and mill.

The annual statement of the Butte & Boston Mining Company shows the capital stock of the company $5,000,000, all paid in, and the indebtedness $2,394,238.38.

OVER twenty tons of pumping machinery from the Grand Prize mine at Tuscarora, Nevada, is being shipped to G. W. Grayson's mine near Baker City, Oregon.

ESTIMATES have been asked for the erection of a sixty-ton concentrator on the Washington mine in the Slocan district, B. C., and the building of a tramway 1500 feet long.

COMPETENT judges estimate that there are about 3300 stamps in present operation in this State. In the one district of Witwatersrand, South Africa, there are nearly 3000.

SPECIMENS of quartz ore from the Pennsylvania mine, Nevada Co., have been bought by J. V. Bretonnel of this city at $15 per pound for use in the manufacture of jewelry.

THE De Lamar, Nevada, August output shows: Tons crushed, 3618; bullion realized, $75,227.53; ore shipped, 550S; total revenue, $81,227.53; expenses, $41,668.33; profits, $39,559.20.

IN the suit of Fox vs. the Hale & Norcross Mining Co., Judge Hebbard has fixed October 21st as the date when he will hear evidence on which is to be based final judgment.

MR. W. S. CATES of Colfax, Wash., has bought the Baisley-Elkhorn mine, near Baker City, Or., for $31,000 cash, and expects to expend considerable money in developing the property.

MAJOR FRANK MCLAUGHLIN has taken hold of the Rock River mine at Oregon Gulch, Butte Co., appointed Geo. Fequa superintendent, who with a force of men will reopen and develop the mine.

THOS. LOVEJOY is under arrest at San Andreas, charged with obtaining money under false pretenses. He fixed up some quartz with gold paint, told G. Everson the specimens were easily worth $1000 and got $350 from him.

A SILVER NUGGET is reported discovered near Richmond Basin, Arizona, weighing 393¼ pounds. The size is phenomenal and its apparent purity excites comment. It is about 12½ inches long and reported to be almost pure silver.

THE Kinkead Mining and Milling Co. expects to get to work in the next thirty days on the old dumps of the Con. Va. mine. If the process is found to be at all profitable, considerable of the same kind of work will be done in that locality.

THE Homestead mine, near Gold Lake, Sierra county, has permission to operate that mine by the hydraulic process. The Debris Commissioners also issued permits this week to build dams at the Canada and Argentine mines in Sierra county.

THE managing owner of the Rawhide mine, Tuolumne county, says the August gold output of the mine was $87,000, and that the property is not for sale. When the new stamps are ready he expects to make and maintain the monthly output $100,000.

THE New Era Mining Co., which recently put a boat and dredger on the Yuba near Brown's Valley is to add a large pump, when it is expected water will be secured in sufficient quantity to wash the material raised by the buckets from the bed of the stream.

AT the Broken Hill Proprietary (Australia), for the week ending September 5th, 6408 tons of ore were treated, yielding 646 tons of lead, containing 119,777 ounces silver; also 1788 tons treated by amalgamating and leaching plants, producing 30,468 ounces silver.

THE Montana Ore Purchasing Co. has recently declared a dividend of $1 per share, aggregating $70,000. The output of the works this year is estimated at 16,000,000 pounds, which at 12 cents per pound will yield $1,920,000 to the management, of which $1,000,000 is for labor and supplies.

T. S. JOHNSON of this city is credited with a discovery of great value in a practical method of separating the gold from the abundant magnetic black sand on the beach line from Alaska to Chile—a problem that has engaged the unsuccessful attention of many metallurgists for many years.

THE S. P. Co. will give a one and one-third round-trip rate to delegates attending the convention of the State Miners' Association in this city on the 14th of next month. That is, for one and one-third times the regular fare one way a round-trip ticket will be issued from any station on the company's lines.

THE name of Robt. McMurray is prominently mentioned in connection with the presidency of the Cal. State Miners' Association. The name of Julian Sonntag is also favorably mentioned regarding the secretaryship. In case Messrs. Neff and Ralston decline re-election, it is thought that the interests of the association would not suffer at the hands of these gentlemen.

AN action was begun last week by the County of Yuba against J. F. Cowdery, Donahoe, Hayes and a number of other defendants to restrain them from mining by the hydraulic process at a place called St. Louis and discharging the debris from their mines into Slate creek, which creek empties into the Yuba river. The complaint is signed by Robert T. Devlin, attorney for the State Anti-Debris Association.

DESPITE the roseate announcements of the early summer, the Meadow Lake ores are still unworked. A correspondent, discussing matters and things, says it is wrong for this paper to use the word "rebellious" in speaking of any ore. Probably it is; but in the case of the irreducible, contumacious, refractory and insubordinate character of the Meadow Lake ore, the word "rebellious" seems to have an animate descriptive fitness.

THE July report of the Robinson Gold Mining Co., South Africa, shows: Stamps at work, 70; net running time, 30 days; tons crushed, 9700; tons per stamp per diem, 4.6; gold won from above, 9874 ozs. 14 dwts. Chlorination and cyanide works—Gold from concentrates, 1319 ozs.; bullion from tailings, 1579 ozs. 15 dwts.; from own ore, 12,773 ozs. 9 dwts.; gold from concentrates purchased, 2050 ozs. 16 dwts.; total, 14,824 ozs. 5 dwts. Profit for month, £32,719 9s. 6d.

THE Shasta *Free Press* says "there is here a gentleman named Walter de Varila, whose headquarters are in San Francisco, and who states that he is in search of mining property. He wants to buy three mines, and his backers are willing to expend all the way from $100,000 to $500,000." Similar items are observed in other papers; it is to be noted that developed mines are in demand, but an undeveloped claim has no better chance for sale now than it ever had.

THE third annual report of the Colorado Fuel and Iron Company, of Pueblo, Colo., for the fiscal year ending June 30, 1895, shows that the gross earnings for the year were $5,667,185, as compared with $4,375,474 for the preceding twelve months. The company earned all its fixed charges, paid a dividend of eight per cent on $2,000,000 of preferred stock, and at the end of a year had a surplus of $48,674. The net earnings were $804,229, an increase of $143,464 over the preceding year.

THE Live Yankee Gravel Mining Company, with the location of works and the principal place of business at Graniteville, Nevada Co., has incorporated; capital stock $25,000: $1 par value. Subscribers—W. McLean, 4000 shares; W. Mobley, 2000 shares, and the following named 1000 shares each: G. A. Stinger, P. S. Waldron, H. Dundon, E. W. Foss, D. King, E. O'Brien, R. Monteith, A. Monteith, O. Penrose, W. Foss, W. Kallenberger, F. Cummings, T. C. McGagin, J. Derre.

THE Australian Smelting Company, with a capital of £500,000, has bought 500 acres of land at Lake Illawarra and will build a smelter. The process is an electrical one. It is expected that 1500 tons per day will be treated. The raising of the money for the construction of the harbor at Lake Illawarra has been undertaken, and it is expected that the work will be completed within three years. John Howell, whose statement appeared in last week's issue, is managing director.

THE London *Times* of August 25th says: "The minds of all English mining men appear to be so engrossed in South African ventures at present that they will pay no attention to anything else. One of the most deplorable results of this is that they are allowing the first fruits of perhaps one of the richest mining fields in the Empire to be reaped by aliens—nay more, they are allowing a province of Canada to become American in men, manners, money and sentiment. As long as British Columbia was only known as a silver field, this was comprehensible, although our silver deposits have now proved themselves rich enough to pay, with silver even lower than it is at present. But since last year a gold-bearing belt of ore has been discovered and opened up which, added to our gold-bearing gravels, seems likely to give British Columbia a prominent place among the gold-producing areas of the world."

ONE HUNDRED AND FIFTY MEN have been put to work on the foundation for the Parrot Company's new million-dollar smelter at Gaylord, Montana. Some of the men are excavating, while the rest are working on the foundation walls. Large boarding-houses are now in course of erection at the new town to take the place of the tents, which have served as temporary quarters for the men, and it is the company's expectation to have 300 men at work there before the end of the month.

THE "boom" in gold mines appears to have struck Spring City, Tennessee, from which place is received a letter desiring the PRESS to purchase stock "in some good, reliable California gold mine." The writer limits the matter somewhat by the statement that he would be "willing to pay one or two cents per share," though he "might pay more if necessary." He desires the names and addresses of paying stock companies desirous to part with their holdings at the prices named.

THE Bureau of Statistics of the Treasury Department reports that gold to the value of $16,667,261 was exported during August, making $55,766,217 for the eight months of the year. The excess of exports over imports is placed at $15,159,582 and $27,702,341 as opposed to $1,915,303 and $54,233,281 for the corresponding period of 1894. Gold ore showed a total export for the eight months of over a million.

THE bonding of the Desert Queen mine, San Bernardino Co., has brought considerable to the surface. The Baker Iron Works of Los Angeles has attached for $2110 due for supplies, one G. W. Myers has sued for a third interest, alleging that he prospected the claim with the two McHaneys and that it was to be share and share alike. A convict named Chas. Marshall, under present sentence of death, claims a fourth interest on precisely the same claim as Myers, and at present the prospect is bright for the mining lawyers of that vicinity.

SECRETARY CARLISLE has rejected the proposals submitted for assaying and sampling ores on the northern and southern borders of the United States, to ascertain the percentage of lead contained therein, and takes the position that it is impossible to carry out the intent of Congress when bids for doing only part of the work are submitted. He thinks that the work can be done cheaper by the government, and will ask Congress for an appropriation sufficient to establish ore sampling works at the principal ore importing points along the Mexican and Canadian borders.

SAYS the Butte *Inter-Mountain*: The Anaconda Company paid out for wages in Butte last week $212,000. This means that the mining payroll of the company numbers about 2120 men, or about one-half the total force of miners employed in the district. At the Anaconda smelter the wages disbursements were about the same, and a large part of the money found its way to Butte. The wages paid at the lumber camps and sawmills swell the total to about half a million dollars, or at the rate of $6,000,000 per year for the Anaconda Company alone. These figures need no elaboration. No other mining company in the world has such a payroll.

THERE is a large amount of money invested in a diamond drilling plant. The value of the diamonds used is $20 per carat, an increase of $4 over last year. This increase, it is understood, is due to the recent demand for diamonds in South Africa, where extensive drilling operations are being pushed forward. No less than fifteen drills have been lately shipped to the Johannesburg field, and more are on the way. Every hit is fitted with from $400 to $500 of the little black stones, and as there are two hits necessary in the putting down of a hole, the cost for diamonds alone is in the neighborhood of $1000. These little jewels rapidly wear out, the loss in this item alone being about 50 cents a foot.

DURING the last ten days the following mining companies have incorporated in the State of Washington: Gold Hill Mining Company, Spokane: capital $500,000: incorporators, R. T. Daniels, T. B. Jones, M. Doneen, N. B. Buckler, J. W. Winthrop, R. M. McLean, John A. Currie. Post Falls Woolen Mills Company, Spokane: capital $10,000; incorporators, E. Denzel, R. Came, W. H. Came, F. E. Denzel. You Like Mining Company, Spokane: capital $1,000,000; incorporators, John S. Baker, H. W. Baker, J. H. Boyd and W. J. C. Wakefield. Giant Mining Company, Spokane: capital $500,000: incorporators, W. J. C. Wakefield, J. H. Boyd, H. W. Baker, J. S. Baker. Evening Star Mining Company, Spokane; capital $1,000,000; incorporators, D. M. Drumhiller, F. P. Hogan, S. S. Bailey and others.

MENTION was made on the 7th inst. of an agreement said to have been entered into between Jas. R. Morse of this city and the King of Corea, wherein for his services the former was granted extraordinary concessions by the latter in the development of Corea's mineral resources, alleged to be very rich. Renewed interest is felt in the matter by the departure on the Coptic of A. W. Deshler of Detroit and J. K. Eveleth of London, two mining engineers who are credited with being secret envoys from rival syndicates, each with the same purpose—to inspect and investigate Corean mines with a view to resultant business. It is understood, however, that the royal arrangement with Morse is largely in the nature of an exclusive franchise, though on this latter point advices from Clarence Greathouse would be of present interest.

J. C. CRAMER and D. G. Silliman, two Montana mining men, who went to Cook inlet via Kodiak and Yakutat, with the intention of extracting gold from the ocean beaches, report failure in finding gold in paying quantities, to the Alaska *Record*. "They thoroughly prospected miles and miles of shore along Black Sand island and a score of other places said to contain gold-bearing sands, but 14 cents to the ton was the highest amount taken from any one place, at which figure nothing could be made excepting where an enormous number of tons could be handled. They found the country entirely unsuited to the production of the yellow metal, and expressed the opinion that the gold found in that neighborhood was deposited by glacial action and brought from far in the interior. They prospected for miles back of Cook inlet for quartz ledges and any other formation liable to contain gold, but failed to find the least indication that the country in the immediate vicinity was such a country that would produce gold, except as spoken of—by being brought from the interior—and is extremely fine or flour gold. The party originally consisted of six men and was provisioned for thirty months."

Alcatraz Asphalt.

(Continued from page 197.)

a chemical union, it is a tough elastic cement, which is barreled and sent abroad. When used it is mixed with the requisite quantity of sand and applied in the usual manner of constructing asphalt street pavement.

Though handicapped by distance and consequent high rates, the merits of this California-made asphalt have given it ready and increasing sale in Denver, Omaha, and as far east as Syracuse, New York City and Brooklyn, N. Y. In the past few months sufficient has been sent by rail and ocean to pave ten miles of city streets, and wherever used it is its own best advertisement. The enterprise is distinctively Californian; it has the world for a market, and stands solely on its merits as a desirable material for street paving. It illustrates one of our mineral resources partially developed, and as such the MINING AND SCIENTIFIC PRESS has deemed it worthy of illustrated notice.



FIG. 3.—ALCATRAZ REFINERY AT LAS CONCHAS MINE, LOOKING WEST. (See page 197.)

Crushing the Apprentice.

Some men wonder, as does a friend of mine, why it is that they constantly have to be training up new men and apprentices, and that the moment they know anything they up and quit.

The reason for this most aggravating state of things is, happily, not always that which sends my friend's apprentices from him, viz., crossness and brutal ridicule. I happened in his shop just when my friend was directing his bright young apprentice how to do a very simple piece of lathe work. "Now, I wonder," said he to the trembling youth, "if you know enough to do this just as I will show you?" The he showed him every movement; just how to hold the wrench, and pull the belt, and pick up and put down the piece, saying all the time: "See how easily and swiftly I do it. If you know anything you can do it just as fast and perfectly. Now try it." Thus encouraged (?) the boy started in, and, of course, did not make just the same movements as the boss. "No, no; you confounded idiot, didn't I tell you that wasn't the way? Can't you see that I take the wrench in this hand? Now, let me see if you know enough to do as you are shown. Come, hurry up; I can't waste my precious time teaching a blockhead and then"—turning to me—"have him leave me as soon as he comes to know anything."

The poor boy, sweating at every pore and trembling in every limb, and fearing to make a move lest it should be a false one that should call forth another torrent of abuse, made another and very skillful attempt, while his tormentor, turning to me, pleasantly (?) remarked: "None but d——d fools, I believe, try to learn the machinist's trade."

And, yet, my friend is one of the finest and most ingenious machinists that I know. From a mechanical point of view it is as great a treat to visit his shop as it is distressing to witness his brutal and degrading treatment of his help. No wonder he is constantly compelled to break in new help, for his breaking-in houses every latent evil passion in the breast of the learner and the moment he has caught a smattering of the really fine training he is getting he leaves for a more congenial shop, one where he will not be jumped on every moment by the boss.

Could anything be more shortsighted than such treatment, breaking up the spirit while training the hand, as though one could live and bud into success without the assistance of the other. Apprentices even are human beings, and real genius may be driven into despair if met at the threshold of development by ridicule, belittlement and condemnation.—Lapis, in the Age of Steel.



FIG. 4.—PORTION OF LAS CONCHAS MINE, LOOKING EAST. (See page 197.)

Some Legal Points.

An outlawed debt still holds the debtor under moral obligation, but no court can compel its payment.

A stockholder's right of action to compel delivery of his stock does not accrue till his right to same is denied.

Where an action is in itself unlawful, the law will presume a criminal intent from the intentional commission of the act.

One is not guilty of negligence unless he omits to do something which a reasonable man would do, or does something which a reasonable man would not do.

A clause written across the face of a contract is presumably the last expression of the agreement of the parties, and the one most in mind at the time of its execution.

When a stranger to a recorded title enters into possession of land, his entry is assumed to be hostile to the real owner, and his possession is the continued assertion of an adverse right.

Numerous adjudications demonstrate that



FIG. 5.—ALCATRAZ ROCK ASPHALT IN TUNNEL AT 125-FOOT LEVEL. (See page 197.)

business cannot lawfully be conducted upon the public streets, and that the constant placing out of show cases for the exhibition and sale of goods is unauthorized and illegal.

The declarations of one in disparagement of the title he had once held to land, made after he had parted with the title and when he was not in possession, are inadmissible to affect those holding under him.

After knowledge of defects which may render the employment dangerous, unless the damage is imminent and obvious, the servant may continue in his employment a reasonable time, in reliance upon a promise of the master to repair.

When an indebtedness consists of principal and interest and a payment is made by the debtor, which is not applied by him or the creditor to any part of the indebtedness, the law applies the payment first to satisfy the interest, and then the principal.

An officer forfeits the protection which the proper execution of legal process affords, and becomes a trespasser from the beginning, when he is guilty of such an improper and illegal exercise of authority under it as warrants the conclusion that he intended from the first to use his legal authority as a cover for his illegal conduct.

It is the invariable rule, well understood by the profession, that an opinion of a court of last resort becomes authority only upon the point decided, and that its opinions upon other points are of no binding force or effect—indeed, that such passing declarations have no weight whatever, except such as the cogency of the reasoning may entitle them to.

An electrical engineer finds the relative quantity of heat given off by different forms of light to be: Arc light, 4; incandescent, 14; kerosene, argand burner, 331; gas, argand burner, 380; candle, 473; gas, butterfly burner, 511. In the matter of vitiating the air, electricity of course compares even more favorably with other sources of light.

Critical Periods in the History of the Earth.*

NUMBER V.

By JOSEPH LE CONTE, of the University of California.

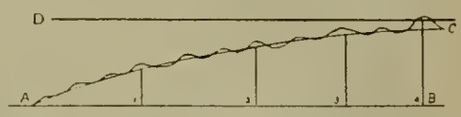
PROGRESSIVE CHANGES IN SUCCESSIVE CRITICAL PERIODS.

It may be interesting to compare the successive critical periods with one another and show in them also progressive change or evolution.

1. Critical periods have gradually become shorter, the changes in physical geography less and less, and therefore the changes in organic forms, in so far as they are connected with these latter, also less and less. The shortest in duration, the least in geographical changes and the least complete and sweeping in changes of organic forms is the last. It is for this reason that it is not usually recognized. But this is exactly what we ought to expect from a comprehensive survey of the whole history of the earth, i. e., from the point of view of evolution.

2. But on the other hand the effect of the introduction of new dominant types in the whole organic kingdom has been steadily increasing. It was great in the introduction of the great reptiles, much greater in the introduction of man. Thus this last critical period is not a whit behind the other in importance, and therefore deserves no less than the others to be used as separating Primary Divisions of Time.

3. The oscillations of temperature characteristic of critical periods have probably gradually increased with the course of time. Local oscillations of temperature doubtless occurred frequently. At critical periods they were both greater and more general, but I suppose that glacial conditions at sea level in middle latitude regions was reached but once, viz., in the last. This is illustrated by the accompanying figure, in which the abscissa A B represents the course of time, the ordinates the degrees of cold, and the height of the line D E represents such a degree of cold as is necessary to produce glacial conditions at sea level in middle latitudes. The gradual rise of the line of cold, A C, represents the gradual cooling of the earth surface, whether by secular cooling or by decrease of carbonic acid and water in the atmosphere, or by both; and the waving of the line, the oscillations of temperature. The numerals 1, 2, 3, 4, are the times of revolution or critical periods marked by greater and more general oscillations, the smaller intervening waves being the more local oscillations. It is seen that only once, i. e., during the last critical period, partly by increased general refrigeration, but mainly by a concurrence of causes, geographical and astronomical, true glacial conditions (represented by the line D E) were reached.



Critical periods, as already said, are of long duration and changes during such times are not simultaneous everywhere, but rather propagated from place to place. This is especially true of the changes in organic forms. These are propagated by a wave of migration which may extend far beyond the limits of the physical changes. Therefore the time of greatest change in organic forms may not be exactly synchronous everywhere. This fact gives sufficient room for the application of Homotaxis.

GENERAL FORMAL LAWS OF THE EVOLUTION OF THE ORGANIC KINGDOM.

We may now profitably sum up the general formal laws, or the general process, of the evolution of forms; for it is these more than aught else which determine the divisions of time, both primary and secondary.

General Advance by all Factors.—Let us imagine then, first, a steady advance of the whole organic kingdom, everywhere and all along the line, under the operation of all the factors of evolution known and unknown, whatever these may be. If this were all these would be successive geological, but no simultaneous geographical, faunas and floras. Organic forms would change in time but not differentiate in space. The determination of synchronism or of a geological horizon in different continents, would be easy because the identity of fossil forms of the same time in all parts of the earth would be absolute. A chronology of the earth would be easy to construct because it would be the same everywhere. There would be everywhere but reprints of the same history. This is one extreme, but we know it is far from the real truth.

Origin and Increase of Geographical Diversity.—Different conditions in different places isolated from one another by barriers, physical, climatic, or both, and therefore without mixture of species by migration, give rise to different rates or directions of advance and therefore to divergence of geographical faunas and floras, which increases without limit with time. If this were all, there would long ere this have come about an extreme diversity of geographical faunas and floras; more extreme than any we now know. Indeed, so extreme that determination of synchronism of strata of different places by comparison of their fossils would be impossible. The geological history of each country must be studied for itself. There could be no general history of the earth and no general classification of the strata. This is the other extreme; but neither is this true.

Critical Periods Diminish Geographical Diversities.—But from time to time, at great intervals, there occur critical periods, i. e., periods of great and widespread changes in physical geography, and therefore of climate, and therefore, also, in organic forms. These latter changes, as already explained, are determined partly by the pressure of a changed environment and partly by wide migrations—both permitted by removal of barriers and enforced by changes of climate—and the consequent mixing of faunas and floras previously separated, the severer struggle consequent thereon and more rapid rate of evolutionary changes. In connection with the new conditions, the severer struggle and more rapid evolution, there would arise at these times new and higher dominant types which would still farther increase the change of organic forms by compelling a new adjustment of the whole organic kingdom. This is especially true of the effect of the appearance of man.

The effect of all this would be to hasten the steps of evolution and increase organic diversity. These critical periods form the lines which delimit the primary divisions of history.

(To be Continued.)

* Bulletin No. 11, of the Department of Geology.



FIG. 6.—GENERAL VIEW OF CAMP AT LA PATERA MINE. (See page 197.)



FIG. 7.—ORE DUMP OF ALCATRAZ ROCK ASPHALT AT MINE. (See page 197.)

Mining Summary.

CALIFORNIA.

Amador.

A DIAMOND DRILL.—*Republican:* The Alma has a diamond drill for prospecting operations, which was brought up the latter part of last week with two experts to get it in running order. The drill was started in the east crosscut Monday. In eight hours it drilled 30 feet, and in four hours on Tuesday it passed through 20 feet of black slate. This is prospecting at a lively rate in comparison with the slow process of tunneling. The drill takes out a core nearly an inch in diameter. The miners have been temporarily laid off, to await the result of drilling operations.

Calaveras.

SUDDEN RISE IN THE STANISLAUS.—At the Navis claim on the Stanislaus river, last week's sudden rise in the river—five feet, washed away their wheel and other improvements, one of those occurrences that sometimes take place in the mountains in the latter part of summer at almost a moment's notice—a cloudburst. Twenty thousand inches of water entered the water company's flume one morning last week from this cause and the following morning this had dwindled down to 600 inches.

Messrs. Horswell are testing with the cyanide process tailings on the old Calaveras mine property.

SUCCESSFUL.—*Citizen:* L. Ricard's invention of a machine that would meet the requirements of tunneling through gravel and cutting away quartz is being operated at the old Osborn mine about a mile south of Altaville.

THE CRYSTAL MINE.—The Crystal mine is to be opened immediately. This is the property recently negotiated for by Mr. Butts with Messrs. Hardy and Osborn. A force of sixteen men is to be put on in a few days.

THE BANNER GRAVEL MINE.—The Banner gravel mine bouders have an eight-stamp mill with a crushing capacity of eighty to a hundred tons of gravel per day. The shaft is ninety-five feet deep and drifts are being run.

El Dorado.

THE BLUE GOUGE BONDED.—*Democrat:* Upon a favorable report by their expert, the Blue Gouge mine, just south of Sly Park, has been bonded to John W. Mackay and E. A. Head. They will commence experimental workings without delay, and if they shall verify the report as to the extent and value of the mine the bonding millionaires will put up the largest milling plant in the county. Messrs. Bind and Reeg step down and out to give the bondholders and their money a chance.

Bishop & Co. are putting up a 10-stamp mill near Henry's.

Merced.

AT LA GRANGE.—*Star:* Placer mining above La Grange is attracting considerable attention in that section and a great deal of work is being done. A number of farmers are prospecting in the river bed, in old gravel mining grounds, realizing from $1.50 to $2.50 per day. Modern appliances are being used as the gold is very fine and hard to save.

The new mill at the Horseshoe mine in Hunter's valley was started up last week and everything worked like a charm. It is the intention of the owners to make a three weeks' run on the rock before cleaning up.

Nevada.

BOUGHT BY A SCOTCH COMPANY.—*Transcript:* It is a Glasgow company that purchased the Trevaskis mine. The company will be known as the Red Hill Limited Mining Company. Captain Pryor, the company's representative, who arrived here a few days ago, has had preliminary work started to determine the best point at which to begin active operations. When this is accomplished the company will put up machinery and proceed to develop the property in a practical and scientific manner.

SOLD THEIR MINE. — *Transcript:* Colonel Callahan has purchased the mine lately owned by Thomas, Ott, Schmidt an others, on Sweetland creek, in Bridgeport township. The claim is an extension of the Boss mine, and is regarded as a valuable property.

HAS NOT CLOSED DOWN — The English Mountain mine at Graniteville has not closed down. The mine is running full hlast, and is likely to continue. Work is being prosecuted on three levels. The ore bins contain over 500 tons of quartz, and twenty stamps are kept running day and uigbt.

Placer.

WILL HELP OPHIR.—*Republican:* The Selby Smelting and Lead Company, of San Francisco, are offering to treat quartz ores containing less than $50 valuation for $10 per ton. This figure does not apply to less than carload lots. At this low price for treatment a miner having ore containing $20 per ton or over can realize a good margin on it, as $14 at the most will cover the charges for smelting and transportation. The railroad company has made a rate of $2.60 per ton per carload from Auburn, and a $2.40 rate from Newcastle. This is a boom to the Ophir miners, as there is plenty of $20 rock in the district. Heretofore the miners could not work their claims on account of the rebellious nature of the ore when milled, hut the radical cut made in treating it by the Selby Company lends encouragement to miners with refractory ore to go ahead and develop their property. The Selby Company make assays as soon as the ore is received and within less than a week returns are made to the shippers.

Siskiyou.

F. C. Mathyas, representative of the California State Mining Bureau, has been investigating the mines of Siskiyou. He reports a company at work a short distance below the mouth of the Salmon, putting in a wing dam to turn the Klamath, so as to mine the bed of the river, which is supposed to he very rich. They have at present about forty men employed and are rushing the work, as they will be unable to do anything after the first rains, which will raise the river and carry away the dam and other appliances. In the neighborhood of $6,000 has already been spent in preparation. Before operations were begun there were 15 feet of water and 8 feet of gravel to be overcome before bedrock could be reached where the gold is generally found.

Mr. Mathyas will now make an investigation of the mineral resources, including copper, chrome and beach mines of Del Norte. The result of his investigations will be published in the report of the Mining Bureau. This is the first representative of the Bureau to personally visit that county.

SPOT CASH WANTED.—W. P. Bennett, of the Forks of Salmon, who has been in Yreka for several days past, has been communicating with a San Francisco mining syndicate, desirous of purchasing his hydraulic mines at Forks of Salmon. The price agreed upon is $100,000, and the San Francisco men want to pay $50,000 cash down, with time for balance, but Mr. Bennett wants spot cash.

Plumas.

AT GRIZZLY MOUNTAIN.—*Independent:* Dr. P. H. Dow, manager of a mining syndicate formed at San Jose with a heavy capital to invest in the purchase and operation of Plumas county mines, was in town several days ago, and now is examining a mining property in the Grizzly mountain range, in which the syndicate is interested.

Shasta.

WORK SUSPENDED.—Work on the mill and mine of the Eureka Tellurium Company at Middle Creek is suspended and all the men employed discharged. The closing down is thought to be only temporarily.

MORE MEN.—The Iron Mountain Mining Company are putting on more men all the time and have made arrangements for 100 extra men.

MOUNTAIN MINES CO., LTD.—On the Iron Mountain Railway, about 400 men are employed along the route, which extends thirteen miles through a rocky country on Spring creek. The men are paid $1.75 per day; board is $4.50 per week. The smelting plant is to be built two miles from Shasta, near the line of the Southern Pacific Railroad Company. The Southern Pacific is building a spur to run from their road to the smelter, while the mine owners are pushing the road from the smelter to the mine.

E. Durfor has completed a contract on a tunnel on the Hornet mine, recently purchased by the company, located two miles from the Lost Confidence mine, on the other side of Iron mountain on Boulder creek, in the same range. There are two tunnels—one is in 112 feet without ore; the other, lower down, runs in from the creek a distance of 130 feet in ore.

Sierra.

A GOOD CLEANUP.—*Messenger:* The cleanup at the Bald Mountain Extension mine during the last two weeks bas been over $6,500.

Trinity.

THE NIAGARA MINE.—*Journal:* Auother rich strike was made in the Niagara mine last week. Two shifts are now employed and the mine is being run to its fullest capacity.

Tuolumne.

ACTIVE OPERATION.—At the App Heslep mine the new 40-stamp mill is nearly completed. The shaft is being enlarged to three compartments as far down as the 800-foot level. Three electric hoists are being erected on the three shafts of Miller and Holmes mine. At the Golden Rule E. A. Steut is putting down a 500-foot shaft.

NEVADA.

GOLD HILL MINES.—The weekly reports of the Gold Hill mines are as follows: Con. Imperial—No. 1 crosscut west is now out from surface tunnel 40 feet, 14 feet having been added during the week. The face is in porphyry and quartz of no value.

Crown Point—The water in the Carson river having raised sufficiently to furnish a power to permit of the Mexican mill running full, and the mill having started on the 20th inst., work was resumed in the mine on the 21st. The west crosscut on the 600-foot level has been extended 11 feet, and is now out 91 feet; in porphyry where it has been stoped. The west crosscut on the 700-foot level, opposite No. 2 east crosscut, is out a total distance of 24 feet, the face being in porphyry with clay slips through it. The stopes present no important change. Going south on the fifth and sixth floors, the quartz has been most entirely cut out by clay, which is raising in the face as they continue in that direction. From that floor to the twelfth the quartz is from 8 to 12 feet wide and will assay from $8 to $12 per ton, principally gold. During the week they have shipped to the Mexican mill, for reduction, 300 tons of gold ore, the average battery sample of which was $9.47, of which $8.47 was gold.

Belcher--Hoisted 20 tons of ore; average assay of car samples, $21.32 per ton. The 300 joint west crosscut has been extended during the week 19 feet. The face of drift is in porphyry. Have suspended operations in the mine for a few days to make necessary repairs.

Seg. Belcher.—Hoisted during the week 15 tons of ore, average assay $18.35. The 300 west crosscut has been extended 19 feet; face in porphyry.

The Confidence official letter says: Extracted 22 tons of ore during the week ending to-day. Average assay of ore samples was $38.22 per ton. No. 1 crosscut west is now 140 feet in the surface tunnel, 18 feet having been added during the week. From the west drift from the top of the upraise we have passed through the ore into what seems to be broken ground.

MORGAN MILL RETURNS.—The official returns of the ore worked and bullion produced at the Morgan mill for account of the Con. Cal. & Va. mine for the month of September are as follows: Ore worked, 1118 tons and 660 pounds. Bullion produced, gross assay value, $26,136.50, of which $11,718.70 was gold and $14,417.80 was silver. Yield in bullion per ton—gold, $10.47, and silver, $12.89; total, $23.37. Assay value of the ore per ton, per battery samples—gold, $10.51, and silver, $16.99; total, $27.51. Assay value of the above ore per ton, per railroad car samples, $32.93.

LANDER COUNTY.

A NEW MILL. — The Cleveland Gold and Silver Mining Co. has received two carloads of lumber and a large quantity of mining and milling machinery. Jan. 1st a reduction plant will be in operation on ore from the Cleveland mine, which is situated on the west side of Smoky valley, forty-five miles south of Austin. Mr. Byron is president and general manager of the company; J. F. Packer is the superintendent who will have charge.

OREGON.

The steam shovel recently put in by Grant Brothers, the Utah capitalists, for working the flat ground near Granite, has made a trial run in cement and boulders, and is a success. The ground is six to nine feet deep, and the shovel, which operates with a crane, will cut a swath about 40 feet wide and elevate the gravel about 20 feet, dumping it in sluices. Capacity, 3000 yards in 24 hours.

BRITISH COLUMBIA.

THE SMELTER. — Rossland *Miner:* Messrs. Anderson & Costello, who have secured the contract for the Trail smelter, call for 300 men. Ground was broken for the plant yesterday and everybody at Trail is happy. Subcontracts have been let for 2,500 cords of wood and for all the excavation work.

Nelson *Tribune:* The contractors who are to build the smelter at Trail are on the ground, and are asking sub-contractors to tender for 1,500,000 feet of lumber, 1,500,000 brick, 10,000 cords of wood, two miles of flume, and for excavation and masonry work. A certificate of incorporation has been issued Mr. Humphrey and his associates for a tramway from Trail to the Iron Horse mine near Rossland.

ON THE FRAZER.—Asheraft *Journal:* Geo. T. Gardner and associates of Seattle, Wash., are putting a hydraulic on the Frazer about four miles below Spuzzum on the opposite side of the river. The company are building about 7200 feet of flume of size 2x3 to carry water into the mine. They will soon have the pipe and machinery on the ground and expect to have it in operation in about sixty days.

THE UNDERWOOD DREDGER.—Colonel Underwood is purchasing hardware and iron work for his mammoth dredger; a mill at Quesnelle is cutting the required 100,000 feet of lumber. The scow will be built near the bridge at the mouth of Quesnelle, the cost will be about $35,000. He expects to have it completed and at work within the next four months.

AROUND ROSSLAND.—Rossland reports say the present payroll is estimated at $30,000 a month but commencing Nov. 1st, it is expected to increase to $75,000. This estimate is based on the proportion of 125 men to the War Eagle, 100 to the Le Roi, twenty-five to the Josie, Crown Point, Iron Horse, Nickle Plate, Center Star, Columbia and Kootenay and from ten to three men on the other claims that will be worked through the winter. The Cliff if it works this winter will employ at least twenty men. This property has a tunnel in $30 ore and owners recently refused $155,000 for the property.

Three expensive plants have been ordered. The first to arrive will be a large air compressor, boilers and engine for the War Eagle mine. The Center Star and R. E. Lee have ordered similar plants.

THE LE ROI.—*Review:* At a meeting of the directors of the Le Roi Mining Company a dividend was delared of $25,000, or five cents per share. George Turner, who has lately directed the active management of the company's property, resigned from the presidency to take the position of general manager, and his brother, W. W. D. Turner, was elected president in his place.

Nearly four-fifths of the 500,000 shares of the Le Roi are held in Spokane, about 100,000 shares being owned in Danville, Ill.

The company is shipping 3000 tons per month. It pays for freight charges and treatment $14.50 per ton, but has a contract with Heinze, Breen and others who are building the 100-ton matteing plant at Trail Landing, under which they are to take the ore at the bins after October 1 and treat it for $11 per ton. In view of the near approach of this more advantageous arrangement, the company will not make such extensive shipments to the other smelters for the next two weeks.

Most of the ore is now going to the Everett smelter. Two hundred tons have just been shipped to Deadwood, to be used in an experiment with the ores there, and some has also been shipped to Tacoma. The ore is in sharp demand by the smelters because of its heavy percentage of iron.

ALASKA.

NO PLACE FOR TENDERFEET.—In the Yukon district the manner of mining is novel. As the ground is frozen the year round, it is cut during the spring, fall and summer months and thawed out by fire in winter, to be sifted for gold which may be in it, by the placer process. Access to the mines is not very difficult, although they are situated over 700 miles from Juneau, but the trip is necessarily expensive when the amount of food to be consumed is taken into consideration. In order to even attempt the trip a man should have at the very least $500 at his disposal.

IDAHO.

CLOSED DOWN.—The Tiger mine at Burke closed down on the 19th, throwing 125 men out of employment. The management states that the shutting down is for an indefinite period, and that nothing will be done except a little development work in sinking the shaft and the keeping of the mine clear of water. Following so closely upon the suspension of operations in the Poorman mine, this announcement has had a depressing effect upon the cañyon. In all nearly 300 men are laid off by the closing of the two mines.

THE HUNTER AND MORNING MINES.—*Miner:* The Hunter mine is running along smoothly, with a force of fifty-five men. Both the mine and mill will be running on two shifts within a day or two, if they are not already. This will require about twenty additional men, making about seventy-five altogether.

Affairs at the Mourning are progressing satisfactorily. There are about thirty-six men at the mine, most of whom are doing preparatory work. There are fifteen working around the mill, flume and pipe lines.

UTAH.

A NEW INCORPORATION.—The Sunshine Gold Mining and Milling Company has incorporated. Capital stock $2,500,000; J. E. Schwartz president, F. H. Officer treasurer. The corporation is the owner of the following mining claims: Sunsbine, Sunshine No. 2, Gold Point, Lost Link, Excess, all situated in the Camp Floyd mining district. The properties are valued in the articles at $250,000. It is expected that within thirty days the new mill recently erected on the property will be in full operation, and then the Sunsbine will be running the Mercur an even race on cyanides.

NEW REDUCTION PROCESS. — Utab *Patriot:* A new process for reducing silver sulphides has been introduced into the Marsac mill this week. It is owned by the Drew-Walker Refining company, and the present is the first experiment made with it. It seems to work all right, as far as tested. It is claimed that it will reduce the fume nuisance, of which so much complaint has been made in the past, to almost nothing.

SEVIER DEAL CLOSED. — *Tribune:* Charles Lammersdorf, president of the Sevier Gold Mining and Milling Company, who has been here for the past week closing up the deal for the transfer of bis controlling interest in the company, left yesterday afternoon for Gold Mountain, where he will continue in charge of the property until the last payment is made on the property next March.

Before leaving town the last flaw in the title to the property was cleared up between Mr. Lammersdorf and George Arthur Rice, who represents the purchasing syndicate. This little affair was the only item that stood in the way of the closing of the deal on last Saturday, and as stated in the *Tribune*, it was so trivial that the payment of $40,000 was made on Saturdry by Mr. Daily and Mr. Parsons, representing the syndicate, and Mr. Rice was left to clear up the small detail.

When the option was secured on June 14th last, a payment of $15,000 was made on the spot; on Saturday $40,000 more were paid on the purchase, making a total of $55,000 already paid to Mr. Lammersdorf. There are, however, two payments to follow, one on December 14th, and one on March 14th, 1896, and in these two payments the sum of $43,250 will be equally divided, making a total of $98,250 for Mr. Lammersdorf's interest of a little more than 139,000 shares.

MONTANA.

THE U. S. SMELTER.—The United Silver smelter at Great Falls will resume October 1st. All the mines which formerly shipped to Great Falls, but, on account of the high rates made by the Great Northern, began shipping to Everett, Wash., will resume shipments to Great Falls, and a full force will be employed at the Silver smelter.

COPPER PRODUCERS.—*Inter-Mountain:* The present output of the Boston & Montana smelter is about 3,500,000 pounds of refined copper per month. The production of the Butte & Boston is a little over 2,000.000 pounds per month; that of the Heinze smelter, 1,250,000 pounds per month.

THE REGULAR STORY.—W. Hamilton Smith, said to represent an English-American syndicate backed hy the Rothschilds, is in Butte for the purpose of examining the copper properties in this district and the Anaconda mines in particular. In an interview he denied any knowledge of a deal for the purchase of the entire Anaconda properties hy the Rothschilds. The syndicate, which is alleged to have been formed for the purpose of controlling the copper output, has a capital of $30,000,000. The various companies owned hy the Anaconda have an aggregate capital of about $75,000,000. The only purchase the syndicate contemplates is the block of stock which will soon he placed on the market by the Anaconda Company.

A CONSOLIDATION.—After October 1st the Butte & Boston and Boston & Montana mining companies will he under one management, and as soon as possible the two big companies will he merged into one. C. H. Palmer has resigned as superintendent and general manager of the Butte & Boston, and Capt. Thomas Couch of the Boston & Montana will manage both companies.

SOUTH DAKOTA.

A BIG SUIT.—The United States Government has commenced suit in the United States Court to recover $700,000 damages from the Homestake Mining Company, alleging that during the past seventeen years the Homestake Company has cut 1,001,200 trees. The case is one of the most important that has ever come before a Federal tribunal in South Dakota, and over 300 witnesses for the defense are in Deadwood.

NEW MEXICO.

AROUND SILVER CITY.—*Sentinel:* The work of repairing the Silver City & Northern railroad, which suffered so severely during the late floods, is going on. The line has not been operated sine July 9th. Its rebuilding means much to the iron mines of Hanover and the

smelting men of Ivanhoe. It has been almost impossible to do any work on these valuable properties since the closing down of the road. The smelter has a great amount of matte ready for shipment as soon as the road can be put in readiness to receive and handle it. There are hundreds of tons of valuable iron ore also awaiting transportation.

The Ivanhoe smelter, which was closed down for a few days for the purpose of relining the furnace, was blown in last week. The company shipped two carloads of matte to Canon City, Colo., a few days ago and now have another carload ready. The management has completely demonstrated the practicability of the process employed at the Ivanhoe, and now that contracts have been made by which no shortage of ore may occur the smelter will in future run at full blast. They are now treating thirty tons of ore per day and employ a force of twenty-two men.

When the Cook's Peak Mining Co. closed down its extensive mining operations at Hadley, last November, it meant that the property would remain idle indefinitely, or, at least, until the price of lead would so advance as to warrant the working of the same. The Graphic is one of the richest lead mines in the country but the price of lead is so low that there is no money in working it. A watchman is kept upon the property continually but the workings are filled with water.

The Mineral Point Zinc Company at Hanover, is again working its mines. Wm. Swancoat, the superintendent, has eight men at work and a large shipment will be made to Mineral Point, Wisconsin, as soon as the Silver City & Northern railroad is opened up. These mines have been closed down for a long time.

ARIZONA.

HARQUA HALA DISTRICT.—Messrs. Kimball and Wakelin of Phœnix have bought three cars of mining machinery, including a ten-stamp mill, for the Desert mine in the Harqua Hala district.

WAGES INCREASED. — *Citizen:* The very liberal action of the Copper Queen Mining Company in voluntarily increasing the wages of its employes 50 cents a day, is the subject of much favorable remark. The Copper Queen Co. is now paying $3 and $3.50 per day wages.

ECUADOR.

Col. Gage, director of the Plata de Oro placer gold mines in Ecuador says, that within five months ten giants will be at work at the Plata de Oro, and the gold will be shipped to the United States.

Publications Received.

"The Stone Industry in 1894," by W. C. Day; an extract from the 16th annual report of the director of the U. S. Geological Survey, showing the amount and value of the various kinds of stone produced in the country in '93 and '94.

The stone industry for '94 represented an output aggregating $37,377,816 in value. In several of the States there was considerable falling off. The value of the various kinds of stone produced in this State for that year is set down as follows: granite, $307,000; sandstone, $10,087; slate, $5850; marble, $13,420; limestone, $288,900; total, $625,257. The Colorado total is $250,577; Idaho, $18,844; Arizona, $19,810; Montana, $115,270; Nevada, $1600; New Mexico, $5210; Oregon, $4993; Washington, $231,857.

The falling off mentioned above is illustrated by the decreased output for instance in this State, of granite, the value of California granite output for the year '90 being $1,329,018, and for '94 less than one-fourth that amount. The same way with marble, the '90 output in this State being valued at $87,030, and the '94 output at $13,420. In '90, the California sandstone industry yielded $175,508; in '94, $10,087. California limestone output in '90 was worth $516,780; in '94, $288,900. Either these figures are wrong and incorrect, or else they make a very poor showing for this State's branch of that part of the mineral industry. It is believed that while there is a temporary falling off in the demand, and hence in the production of stone in this State in the last two or three years, that more exact statistics would exhibit a better showing than that made by this government report, which in correct completeness does not seem to be up to the usual high standard of these productions. The difficulty of getting reliable statistics is recognized, but even that does not excuse the meagerness of the present compilation.

"The Nicaragua Canal, the Gateway between the Oceans," by W. L. Merry.

The PRESS has had considerable to say in endorsement of this great scheme, and heartily commends the spirit and purpose of this treatise, which clearly shows the business necessity and commercial importance of this proposed artificial waterway. The technical details of the project comprise the following: Total distance from ocean to ocean, 169.4 miles; canal in excavation (a remarkable fact), 26.8 miles; lengths of basins, 21.6 miles; River San Juan, 64.5 miles; Lake Nicarauga, 56.5 miles; free navigation in lake, river and basins, 142.6 miles; elevation of summit level of canal above sea level, 110 feet; length of summit level, 153.2 miles; number of locks, 6; greatest lift of lock, 45 feet; dimensions of locks, 650 feet long, 80 feet wide; depth of canal, 30 feet; least width at bottom, 100 feet; time transit from ocean to ocean, 28 hours; length of Lake Nicaragua, 110 miles; average width, 40 miles; surface area, about 2600 square miles; area of watershed of lake, 8000 square miles.

The work is handsomely issued by the Commercial Publishing Co., 34 California St., San Francisco.

Coast Industrial Notes.

—The Wave Motor Co. is going to put in a wave motor at Capitola at a cost of $9230.

—Northern Pacific earnings show an increase of $61,000 for the first week in September.

—Final surveys are being made for the electric railway between Merced and the Yosemite valley.

—California ships this year 9,000,000 gallons of wine, valued at $3,500,000, a little in excess of that of last year.

—The first carload of crude oil from Los Angeles for the Santa Rosa mine at Perris, Riverside Co., has arrived.

—The British Columbia salmon pack for the season is estimated at 500,000 cases. The total pack in '94 was 494,371 cases.

—The electric companies are going into the gas lighting business and the gas companies are about to embark in the electric lighting business.

—Last month the cargo shipments from Washington and Oregon to San Francisco were 16,030,053 feet as against 20,453,000 feet in August, 1894.

—The Merced Falls Electric Power and Manufacturing Company has incorporated in this city; capital stock $1,000,000; $60,000 actually subscribed.

—The Mechanics' Institute Fair closed its successful exhibition on the 14th inst. It is understood that the financial result is a profit of nearly $10,000.

—Nevada City will have a special election on October 28, when a proposition to bond the city for $60,000, with which to construct water works, will be voted on.

—The total cargo shipments from Tacoma for the eight months of 1895 were 54,431,405 feet. For the corresponding period in 1894 they were 30,859,146 feet.

—The report that the Southern Pacific Co. would next November discontinue one of its passenger trains between San Francisco and Ogden is officially denied.

—The Bullen Bridge Company of Portland, Or., has been awarded the contract for building a $330,000 steel bridge across the Fraser river at New Westminster, B. C.

—For the first seven months of 1895 the lumber shipments from San Francisco were 9,095,875, valued at $150,014; the same month of 1894 the shipments were 10,037,977, valued at $196,698.

—The spars from which the masts of the "Defender" and "Valkyrie" have been made were cut in Sol Simpson's logging camp at Kamilchie, Wash., and afterwards shipped from Port Blakely, Wash.

—The Seattle Drydock and Shipbuilding Company has a contract to build one of the Government's new torpedo-boats. The contract price is $160,000, and Puget Sound fir is to be used in the construction of the boat.

—The date for holding the annual convention of the National Association of Manufacturers, at Chicago, Ill., has been changed to November 19, 1895. The Manufacturers' and Producers' Association will be represented by two delegates.

—Eastern men have subscribed the money, $300,000 in cash, necessary to develop the new sulphur mines lately discovered on the west shore of the Gulf of California. It is estimated that the sulphur can be mined and put on shipboard for $1.10 per ton.

—The Western Canaigre Company of Chicago is planting 8000 acres of land to canaigre near Rialto. It will build a factory for the extraction of tannic acid from the canaigre root for shipment East, and expects to secure 500,000 tons of canaigre root the first year.

—The Fresno *Expositor* of September 12th says that Kings river is to be measured by engineers to ascertain the flow of water at this season, and also to measure the water power at different places, the idea apparently being the erection of another electric power plant.

—Exports of flour from San Francisco during the first eight months of 1895 were 588,800 bbls. as compared with 497,430 bbls. during the same time in 1894. Reducing this flour to a wheat basis gives a total exports of wheat during the eight months of 8,809,000 ctls., valued at $6,031,000 as compared with 4,978,000 ctls., valued at $4,987,000 during the same period last year.

—The Manufacturers' and Producers' Association has incorporated, and the following board of directors have been elected: O. McLaughlin, W. F. Bowers, J. P. Currier, Julian Sonntag, M. McGlynn, R. S. Moore, Louis Saroni, James Sproule, A. Sharboro, M. J. Keller and Lewis R. Mead. The capital stock of the association is $100,000, subdivided into 1000 shares at $100 a share.

—The latest and most careful estimate places the salmon pack of the Columbia river this season at 505,000 cases of 48 pounds each. To make a case of canned fish requires on an average of 70 pounds of salmon as it comes from the water. The 505,000 cases of canned fish represent 35,350,000 pounds of undressed fish, which, at 5 cents per pound, the price paid the fishermen, amounts to $1,767,500.

—J. L. Bass of Redding this week shipped 700 pounds of iron ore to the Shasta Iron Company at Oakland. This company owns a valuable iron deposit on the McCloud river near the United States fishery, and has been spending from $300 to $500 yearly for several years on the property. It is considered the best iron deposit in the county, the ore containing the highest per cent of iron.

—The Colorado Colonization Company has purchased 55,000 acres of land of R. B. Taylor, of South Riverside. The land lies in Pahrump valley, on the line of the California and Eastern railroad. A town site has been laid out and the land subdivided into 20-acre tracts. A. C. Hayes is local manager. The land company claims to be able to grow all kinds of nuts and fruits, except oranges and lemons. Machines for boring wells to a depth of 1000 feet will be put in operation.

—The Union Oil Company have an extensive oil refinery at Santa Paula, Ventura county, which they are represented as intending to remove to the vicinity of Martinez, Contra Costa Co. A tank, ninety feet in diameter by twenty-two feet in height, is being built, and furnaces constructed. The oil will be brought by sea from Ventura county, pumped into tanks and refined. It is the intention to pipe the oil to the California Powder Works and the Selby Smelting Works.

—The Pacific Mail steamer City of Rio de Janeiro sailed on the 24th for China and Japan with the largest amount of treasure which has been taken to the Orient in over two years. The total amount from the various banks and Chinese merchants netted $1,134,200, of which sum $905,400 was in Mexican dollars and $227,000 in silver bullion. This will bring the total amount of treasure exported to China and Japan this month to a figure exceeding $3,000,000. The Coptic, the last steamer to sail, carried over $1,000,000. It is more than two years since a shipment amounting to such a sum has been made.

In Answer to Questions.

The following is received:

(1) A placer claim covers the ground in and on both sides of a gulch, through which passes the only wagon road from the river to some fifty other placer and quartz mines. This road is also the U. S. mail route. Is it possible for the owners of this placer claim, when a U. S. patent is granted them for it, to close up this road and allow no travel to pass through the gulch? (2) Can they prevent any one, after the U. S. patent is granted, from laying a pipe line across their ground to placer or quartz mines above the one they own? (3) Can they close up the U. S. mail route? (4) Was any such law passed by the last California Legislature? By replying to the above you will confer a favor upon many interested miners.

It is difficult to give correct answers to general statements or questions such as the above. The details determine the status of the case, and such details are usually lacking, as in this instance. In regard to question first, if the wagon road has existed long enough to be a recognized highway it could, probably, be kept open if legal effort were so made. The U. S. mail being carried over the road cuts no figure. The contractor agrees to carry the mail from one point to another and the government only requires that he comply with its terms. It has nothing to do with what route he adopts, but assumes that in the absence of designated roads he uses ordinary established highways. Question three assumes the existence there of "a U. S. mail route." It is probable that such assumption is unwarranted. The question is answered in reply to the first question.

The second question may, in general, be answered in the affirmative. It has been decided by the Supreme Court—the date and specific case is not at present accessible—that while general State laws permit the right of way for ditches, pipe lines, etc., "for public purposes," that carrying water to a mine does not come under that head, and if it is desired to lay a pipe line across or over patented ground the right must be secured by private arrangement satisfactory to the owner of the land. Question four is a little indefinite. It would, however, be probably safe to answer it in the negative. The last Legislature did a good many foolish things, but it hardly attempted to interfere with matters under exclusive Federal control.

Our advice to the inquirer is to consult a competent lawyer, if the matter is of sufficient moment to require careful adjudication.

Personal.

A. D. GASSAWAY has been appointed superintendent of the Tip Top mine.

FRANK YEOMAN has been appointed master mechanic of the Boston & Montana mines in the Butte district.

PROF. F. S. EMMONS, of the U. S. Geological Survey, is making a report on the Boise Basin, Idaho, mining district.

W. W. ADAMS, formerly superintendent of the Hope mine, has been appointed manager of the Carson sampling works of Butte, Montana.

HENRY LORENZ, who recently sold his mine and property at Junction City to the La Grange Co. for $140,000, is in the French hospital in this city.

JAMES S. DOUGLAS is now superintendent of the Commercial Mining Company, Yavapai, Arizona. C. E. Mills has returned to Cedar Rapids, Iowa.

H. G. TAYLOR, till recently in charge of the the Anaconda properties at Camp Creek is promoted to the position of general superintendent of construction for the company.

EDWARD GOODIN, E. M., Columbia College School of Mines, '91, has been elected to the lately created chair of mining and metallurgy in the Idaho State university. He will begin work October 4th.

CHAS. STOCKS, foreman Empire mine, Grass Valley, is the 40th miner from that section who has accepted the flattering offers made by owners and superintendents of South African gold mines. The California Colony there is a strong one.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING SEPT. 17, 1895.

546,833.—FISHING REEL — A. J. Arnold, National City, Cal.
546,567.—CUTTING DEVICE—C. A. Byrd, Drain, Or.
546,145.—CLEANING DRAIN PIPES — Cavallaro & Sturdi, San Jose, Cal.
546,586.—DREDGER—W. H. Diestelhorst, Reading, Cal.
546,588.—STAMP AFFINER—W. L. Dinsmore, Portland, Or.
546,447.—ROTARY SCREEN—H. P. Grugin, Bannack City, Mont.
546,614.—PIANO STOOL—A. Gschwend, Portland, Or.
546,450.—ORE FURNACE—H. P. Holland, S. F.
546,536.—BANJO—E. Jacoby, Los Angeles, Cal.
546,537.—LAWN SPRINKLER—R. T. Joy, Tacoma, Wash.
546,538.—BED CLOTHES HOLDER—R. T. Joy, Tacoma, Wash.
546,333.—BABY WALKER — S. Kell, Los Angeles, Cal.
546,492.—TEMPORARY BINDER—E. B. Willert, Walla Walla, Wash.
546,472.—SHADE HOLDER — O. H. Nims, Los Angeles, Cal.
546,428.—FISH SPEAR—H. F. Norton, Seattle, Wash.
546,436.—WATER BANDAGE—B. F. Springsteed, S. F.
546,479.—ADVERTISING DEVICE—C. L. Whipple, Los Angeles, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

PHOTOGRAPHIC SHUTTER.—Samuel Slayton San Francisco, Cal. No. 546,198. Dated Sept. 10, 1895. This invention relates to that class of camera shutters in which apertured leaves are caused to pass each other in such a way as to effect, during their passage, the coincidence of their apertures with the lens or diaphragm opening. The object of the invention is to provide a photographic camera shutter adapted for both time and instantaneous exposures, and of such a character that the holding and locking mechanism shall be positive, the trip mechanism delicate, and the operation comparatively noiseless and without jar. The device consists essentially of the means for operating the pivoted apertured leaves, consisting of a sliding bar connected with the shutter leaves and a pivoted lever connected with said bar and adapted by its movement to effect the sliding thereof. The lever is operated, as usual, by means of an air pump.

ADJUSTABLE ROTARY SCREEN.—H. P. Grugin, Bannock, Montana. No. 546,447. Dated September 17, 1895. The object of this invention is to provide a revolving adjustable screen which is especially adapted for washing and screening auriferous gravel, and for other similar purposes. It consists of circular heads, bars extending horizontally between the heads, with threaded ends and nuts for securing the heads together, other bars around the periphery journaled to turn loosely in the heads, having the intermediate portion of each projecting to one side of the line of the journals, so that the free edges will move about said journals, arms projecting from the journal shafts, and an annular disk having pockets on its inner face, into which said arms project, said disk being slotted at intervals to directly receive the ends of the holding bars, so that it is movable about the axis of the apparatus to open or close the screen bars with relation to each other. A beveled gear is fixed to one of the heads and an engaging pinion by which it is driven, and a sluice is placed directly beneath the cylinder. The coarse rock is dumped from the end of the screen from time to time, or discharged continuously, and the finer material passes through the screen openings into the sluice.

DREDGER.—Wm. H. Diestelhorst, Redding, Cal. No. 546,586. Dated Sept. 17, 1895. This invention is especially designed for dredging valuable auriferous and metal-bearing gravel and sands from the bottom of streams and water courses, but it is also applicable for other dredging purposes. It consists of anchored floats connected together with an open space between them, longitudinal guides or tracks extending parallel with the space, a frame or carriage movable upon said guides, means for locking it at any desired position, a bucket with means for raising, suspending and lowering it, said bucket having a handle, to the lower end of which it is swiveled, a lever extending from the truck or carriage across the open space and means for connecting the handle with the lever so that it forms a fulcrum about which the handle is movable. A chain is connected with the front of the bucket whereby it may be drawn forward about the fulcrum upon which the handle turns. An engine or source of power is mounted upon one of the floats and so connected as to drag the bucket through the gravel at the bottom, turning about the fulcrum point of its handle, and when the bucket is thus dragged, it is forced into the material, traveling in an arc of a circle so as to become loaded. The handle is then disengaged from the lever arm so that the bucket may be raised with its load, by means of a derrick and suspending chain connected with it. By means of the car or traveler, the bucket may be worked from one end to the other of the space between the floats until this space has all been dredged out, when the apparatus may be moved and anchored at some other point.

Scientific Progress.

The Maxim Gun.

Science publishes some "Notes from London," including an account of a visit of its correspondent, R. H. T. (evidently Prof. R. H. Thurston), to Maxim, the inventor. He speaks of the Maxim gun as follows: "The Maxim gun is perhaps the most extraordinary implement of war ever devised. The pressing of a hutton is all that is required of a gunner, the gun loading itself and firing automatically, at the rate of 600 to 800 shots a minute, until the finger is removed or until the ammunition is exhausted. All the needed energy in working the mechanism is supplied hy the recoil of the barrel of the gun. Hundreds of these guns have heen supplied European and Oriental nations, and they have already done much effective work. It seems hardly creditahle to the ordnance authorities of the United States that they should have permitted foreign nations to lead in utilizing so great an American invention. Mr. Maxim has not imbihed much respect for our officials, or our methods of treatment of inventors in this department of applied science, from his personal experience at home."

Some effects of the expulsion of gases from the interior of the earth were dealt with in an address hy Prof. N. S. Shaler of Harvard to the Geological Society of America at its Sgringfield meeting. Wherever gases are generated in a liquid or semi-liquid mass, the pressure is diminished over a given bubble, developing a "chimney" up which a series of bubhles may rush. There is much water in rocks and much more in soft strata. Mud lump springs along river bottoms, and particularly along the Mississippi, are impelled by the liberation of gases. Outhreaks of gases follow earthquake shocks. Hundreds of blow holes or "shock fountains" were formed along the Ashley river after the great Charleston earthquake, ten years ago, these holes being from ten inches to three feet in diameter. The liherated gas was found to have come from a stratum ahout fifty feet below the surface. Very large and strong shock fountains, 100 feet in diameter and throwing mud to a height of 200 feet, were formed along the Mississippi river during the earthquakes of 1811 and 1813. A volcanic eruption works on the same principle.

There are many reasons in favor of the supposition that Mars is more likely to have been inhabited in past ages than at the present time, in spite of its atmosphere, or water, or clouds. Mr. Proctor, for instance, has pointed out that a glohe of the size of Mars would cool rather more than two and a half times as quickly as one of the size of the earth. If the earth and Mars were in a similar condition eighteen million of years ago, Mars would have attained (according to that rate of cooling) to the earth's present condition in seven million years, *i. e.*, eleven million years ago; and the earth would now require twenty-eight million future years in which to cool as much as Mars has cooled during the last eleven million years. So far as regards that consideration, therefore, the prohability of the preseut habitability of Mars must be compared with the probability of the earth's being inhabited when twenty-eight million more years will he past and gone.

A new method of artificial respiration is described in a French journal hy Dr. Berthold Beer. The mucous membrane of the lips and of the mouth is rubbed slowly with a piece of ice, the rhythm of the motion corresponding as much as possible to that of normal respiration. In the cases ohserved hy Dr. Beer, the result was a returu of respiration very strong at first, but, with the continued application of the ice, hecoming very regular, quiet and deep. The ice, moreover, is said to have a general sedative effect, and to have been successfully employed in cerebral troubles. Two cases of asphyxia have been treated in this way hy Dr. Foges of Vienna with equal success. The method is harmless for the patient and easy for the physician, so that it may he employed for several hours at a time.

The steel ring for one of the generators of the Niagara Power Company's plant has just heen finished at the works of the Bethlehem Iron Company, and is described as the largest ring of the kind ever cast. It is 11 feet 7½ inches in diameter, ahout 5 feet high and weighs 27,000 pounds. The process of manufacture is interesting. A nickel-steel ingot 4½ feet in diameter at the bottom and 6½ feet long was cast. A hole was then hored through it lengthwise. A hlock of the proper weight was then cut from the ingot, and the cylinder thus ohtained was heated, and, under a hydraulic pressure of 14,000 tons, expanded to the present size.

About 86 per cent of the heat of sunlight passes through ordinary window glass. A German inventor claims, however, that his new glass sifts out nearly all the heat rays, but is perfectly transparent to light. A plate of the material 4x10 inches, containing 28 per cent of iron in the form of ferro-chloride, allowed only 4.06 per cent of radiant heat to pass through it, while another plate of equal thickness, having quite as much iron in the form of ferric chloride permitted 11.2 per cent to pass.

A new industry has recently heen started in Norfolk. It is a plant for the manufacture of paving hlocks out of fibers of grass growing on salt-water marshes. The grass is suhjected to a heavy pressure and large square blocks come out of the press, when three circular saws take hold of the hlock and cut it into smaller hlocks of about five and a half inches thick, provided lengthwise with long wire. These blocks are then subjected to a bath in three different kinds of oils, which make the fihre supple. The *Manufacturers' Record* is authority for the statement.

Mechanical Progress.

Compressed Air.

A test of compressed air as a motive power for rapid transit cars is being made in Baltimore for the purpose of demonstrating the efficiency and comparative cost of this means of propulsion. Two cars have heen built. Air compressors for the purpose of charging the cars are constructed.

The new cars are of ordinary size and dimensions, with the same seating capacity as those now used. The controlling device for the motorman occupies no more platform space than the ordinary brake handle. All the other mechanism is under the car floor. In process of operation the air is compressed to from 1000 to 2000 pounds per square inch and stored in the station tank. The storage capacity of the seamless steel flasks or containers in the car is considered sufficient to operate the car from twelve to fifteen miles or more, according to the pressure. After passing through a reducing valve aud being lowered to whatever is desired as a working pressure, the air is circulated through hot water and the mixture of heated air and vaporized water passes to the motors, working expansively.

The latest advance in the transmission of images by wire is the telephotograph, a new invention hased upon the remarkahle variability of the electric resistance of selenium under light of varying intensity. The transmitter is a fine selenium point, which is carried by mechanism moving it repeatedly forward and backward in a traveling spiral of very close windings. The receiver is a very susceptihle incandescent lamp arranged to move in exactly the same way as the selenium point. The despatching apparatus resemhles a photographic camera, with the lens so placed that the image to be transmitted is thrown upon the plane in which the selenium point moves. An electric current passing through the selenium point varies with the lights and shadows through which the point passes, and produces in the incandescent lamp at the other end corresponding variations, which trace out a picture identical with that at the despatching station. There are various ways—such as photography, and viewing direct through some magnifier—of making the picture visible. The speed of the selenium point is adjusted to that of the eye for receiving impressions, a continuous image of any part of the picture heing given when the point passes completely over it in ahout an eighth of a second.

A few unfortunate experiences suggest that the aspect of the entire earth might very possibly he transformed if each plant and animal species were to be placed where the conditions were most favorahle to it. The rabbit in Australia and the gypsy moth in Massachusetts have found their new homes so well adapted to them that they are even struggling with man for possession of the land. From the plant world comes the similar lesson of the water hyacinth. A few years ago a man from New Orleans saw and admired specimens of this plant in Colomhia—where it is a harmless flowering plant growing in tuhs—and took home some hulhs and grew them in tuhs in his front yard. In a couple of years the plant appeared in patches in the Bayou St. John, which connects New Orleans with Lake Ponchartrain. A year later the hayou was full of it and navigation was impeded, while it has now overrun all the canals in the vicinity, choked up the rivers, extended in great masses into the lake, traveled a hundred miles westward, and hecome a colossal and ever-increasing nuisance.

Now, when no one talks of huilding ships and railway trains of aluminum, and there are no more processes to reduce it at "two cents a pound," the manufacture is proceeding on the normal lines of evolution. The largest works producing aluminum at this time are in Switzerland, where three tons a day is prepared at an expenditure of 4000 horse power, derived from water power on the river Rhine. In this country the largest works are at Pittsburg, operated by the Hall process, producing one ton a day, hut this company has hegun at Niagara Falls, N. Y., to make two tons a day. The whole product of the world in 1894, says *Industry*. was a little more than 1000 tons, which shows just how far the metal has entered into the useful arts at its present price, which is ahout 50 cents a pound in this country and 35 cents in Europe. It is commonly claimed that aluminum cannot be used for electroplating, but Mr. Darling of Philadelphia has settled that prohlem hy electroplating 100,000 square feet of metal at the new city hall in that city.

What appears to be the most powerful explosive yet produced has heen obtained hy Prof. Victor Meyer from nitromethane hy suhstituting three atoms of the hydrogen to one of sodium. The nitromethane is diluted with sulphuric ether, and the alcoholic solution of the substance resulting from the action of sodium upon alcohol is then added. The precipitate is washed with ether and dried hy means of concentrated sulphuric acid. The explosive force of the compound is terrific, as is also that of the product when potassium is used.

A reason for doubting that oxygen is an element has been given to the London Royal Society by Mr. E. C. C. Baly. Under the silent electric discharge, the gas that goes to the cathode with long sparks is less dense than unelectrified oxygen, while in the case of short sparks it is more dense.

Electrical Progress.

Accumulator Traction.

By Maurice Barnett.

It is a matter of iuterest to railway and electrical men to know what showing hattery traction will make against its competitors, the trolley system and the underground conduit system. The underground conduit system has obtained a foothold sooner than the storage hattery system, hut it is doubtful if the former will come into general adoption. The total operating expenses of the underground system, including interest on investment, is ahout 19 cents per car mile, against 15 cents for the trolley. It is believed that when it shall have heen demonstrated that storage battery cars can compete successfully, under certain conditions, with the trolley system, underground conduit systems will play an insignificant part in the development of electric traction systems in the United States.

The douht as to the advantages possessed by a storage battery system of electric traction is largely the question of operating expenses. The great drawhack has heen the cost involved in the maintenance and handling of the cells in traction work. Iu the old-style storage hattery cars the battery was placed in the sides of the cars under the seats. The expense of inserting and removing this each trip added considerably to the operating expenses. In the new cars the battery will be placed under the car, where it can be handled easily and at ahout one-quarter the former cost of this operation.

The favorahle features of a storage battery system of traction have reference to the fact that each car is a unit by itself, independent of the powerhouse during its trips, and in no way embarrassed hy derangement in the station or overhead equipment, differing in this respect from the trolley system, where a stoppage in power or trouble in any section of the circuit may hang up all cars on the line until the trouhle is removed. Again, as the load on the eugines and dynamos in a storage battery system is constant, it follows that these need not have greater capacity than is sufficient to satisfy the average demand for power. In the trolley system the capacity of the power plant must be such as to enable it to respond to the maximum demand made upon it. As this demand is very variahle, being anywhere from 20 to 300 per cent above the average demand, it follows that the power plant for a storage hattery system will be considerably smaller than that required for the trolley system. This incidentally emphasizes the value of an auxiliary storage battery plaut for roads already equipped with the trolley system, the storage battery serving as a reservoir to store up the energy representing the difference between the average and maximum demand on a generating plant and as a regulator, enahling the engines aud dynamos to be worked at a constant load and securing them from the strains and stresses to which they would otherwise he suhject.

Sarcia estimates that, in the style of car to he used in New York, a saving of .6 cents per mile could be effected in handliug. Suhtracting this from 3¾ cents, given as a result actually obtained in practice, we have 2.7 cents as cost per car mile for maintenance and handling of battery.

Regarding the cost of power, this will depend on price of coal at powerhouse, cost of labor, oil, waste, water and other supplies, thus illustrating the difficulties encountered in making a comparative estimate of costs of power in different systems. From a paper by T. S. Badger on the cost of construction and operation of electric railways, we find that the average cost of power per car mile of twenty-two trolley roads with from 3 to 140 cars in operation, length of track 3 to 51 miles, daily mileage 80 to 150, average daily mileage 110, was 1.96 cents. Now, as in the storage battery system, engine and dynamos are run at a constant load, it is safe to assume that cost of power,

neglecting interest and depreciation, will not exceed 80 per cent of the figure given, or 1.56 cents per car mile.

Trolley construction, where iron poles are used, and where, as in cities, the feed wires must be buried, will cost about $12,000 per mile of single track. As 16 to 20 foot cars can be had fully equipped for, say, $3250 each, two cars (to the mile) will cost $6500. Making an allowance of 15-horse per car at $100 per horse power for power plant, but not including real estate or buildings, we have for the two cars $3000. Cost of road-bed will add about $7500 per mile of track. while real estate, buildings, etc., may be assumed to be $7000 per mile of track, making a total investment of $36,000 per track mile. On the basis of 56,000 car miles run per annum per mile of track length, we have, at 6 per cent per annum, an interest charge of 3.85 cents per car mile run to be added to operating expenses. For storage battery construction there is an item approximating $7600 for batteries for the two cars not found in trolley construction. On the other hand, a saving is effected of $12,000 for overhead construction, while the cost for power equipment and real estate is reduced by one-third, being $2000 for the former and $4667 for the real estate, buildings, etc. We thus have a total cost of construction of $28,267, or say $28,000, and, with the same trackage as in the case already considered, we have an interest charge per car mile of 2.99 cents.

Assuming that, in the two cases just considered, maintenance of road-bed and track, transportation and general expenses will remain the same, we can arrange in parallel the values already given. A general distribution of expenses per car mile is then as follows:

	Trolley. Cents.	Storage Battery. Cents.
Maintenance of road-bed and track	.54	.54
Maintenance of line	.18	...
Maintenance of power plant	.36	.12
Maintenance of rolling stock	1.80	.80
Maintenance and handling of batteries	....	2.70
Cost of power	1.06	1.56
Transportation expenses	4.98	4.98
General expenses	1.26	1.26
Interest on total investment	3.85	2.99
Totals	14.03	14.95

As given here, the cost of operating cars by the trolley and storage battery systems respectively on roads of fifteen miles and upwards, with twenty or more cars averaging about a hundred miles daily, with moderate grades—general conditions covering cost of fuel and supplies, wages, etc., being uniform—shows both systems to be on an equal footing.

It may be said that, even if trolley traction was more economical than storage battery traction, the system would be open to the objections that cars are dependent at all times on the power-house and have no auto-mobile character, as have battery cars; the moment the trolley leaves the line the cars are left in darkness; the high tension currents constitute a source of danger to the traveling public; the trolley line is unsightly, and overhead wires are a formidable obstruction to firemen engaged in the never-pleasant work of fighting fires. A successful storage battery system would be an ideal solution of the problem of electrical transportation.

UNIQUE propositions constantly confront our judicial tribunals. The United States court of the Nebraska district has been asked to assess damages against the electric motor lines for the depredations of vagrant electricity upon the mains of the water company in the streets of Omaha. Here are presented some novel points of law. No precedents have been set to help determine the measure of damages if any. It will remain for the water company to prove by expert testimony or otherwise to the satisfaction of the average jury that some of the electricity which charges the rails and wires of the motor line is constantly inducted to the water mains five to ten feet beneath the surface, and if this can be proved, the fact must be established that vagrant electricity accelerates decay of these pipes, and that, but for the proximity of these motor wires and rails, the mains would be in prime condition. It is an entirely new phase of jurisprudence, and the case will be watched with extraordinary interest by every franchised corporation running pipes under the street and by the electrical world at large.

Without a Trolley.

The Westinghouse Electric Company has made the first successful test of its new electric railway. The new traction system is regarded by some as considerably better than any now in use. At the works of the company in this city a piece of track has been laid on a new plan. It is called a surface railway, as the electric current is taken up directly from the surface of the road between the tracks. Square blocks of terra cotta are set in the road flush with the surface. From each of these blocks there projects slightly above the surface a circular knob of iron about four inches in diameter. These knobs are in pairs, each pair being seven feet from the next pair. The knobs on one side are all connected directly with the wire which carries the power.

As the car passes over these knobs the current is put on or off from them by a series of switches operated automatically by the car itself. By means of a long iron bar under the car, which brushes lightly over the knobs as the car passes over them, the knobs receive from a small storage battery in the car a current which instantaneously operates a switch that throws the powerful motor current into the neighboring knob. This knob is at the same instant in contact with a second long bar which transmits the 500 volt current directly into the two 50-horse power motors. When the car has passed, the switch ceases to operate and the knob is harmless.—American Manufacturer, Pittsburg.

Practical Information.

The Nearest Fixed Star.

An interesting discussion took place recently in Paris at a meeting of scientists as to the distance of the nearest fixed star. A number of astronomers had been asked to make observations of a certain star, and then to report the result of these observations to the meeting.

It was discovered that no two calculations agreed, but the astronomers departed with feelings of great satisfaction, for in no case was the difference between any two results greater than 20,000,000,000 miles.

There are eight planets moving about the sun, of which the earth is one, and astronomers have calculated, with very little chance of error, the distance of these bodies from each other and from the sun. The various results can be conveniently recorded in miles.

But when we come to the fixed stars, which are themselves suns, many of them far larger and brighter and hotter than our own sun, and around every one of which it is not improbable that a family of planets is moving, the task of computing distance is far more difficult. The abyss of space that separates us from our nearest stellar neighbor is so enormous that the human mind cannot form the slightest conception of it.

Nor is the ordinary astronomical unit, or distance of the sun from the earth, sufficiently large to be convenient in expressing the distance of the stars—that is, if we attempt to denote the distance of the nearest fixed star by stating that it is "so many times the distance of the earth from the sun," it is found that this unit is entirely too small to be used with convenience, though it measures 93,000,000 miles.

Experience has shown that it is more satisfactory to take as a unit the distance that light travels in a year, which is about 63,000 times the distance of the earth from the sun. Thus, if we say a particular star is at a distance of ten light years we mean that it is so far away that it will take ten years for its light to reach us, supposing it to have just sprung into existence.

It is curious to think that such comparatively insignificant creatures as human beings, inhabiting a fifth-rate planet, revolving around a third-rate sun, should be able to compute with any degree of accuracy the enormous distance of any one of these stars. The magnitudes are so great that the ordinary mind can comprehend them only when they are represented by some illustrative comparison. This may be done as follows:

If we select any flat surface, such as a level field, and place on it a globe two feet in diameter, we may consider this the sun. Mercury, which is the nearest planet to the sun as well as the smallest of all the planets, will be represented by a grain of mustard seed at a distance of eighty-two feet. Venus will be indicated by a small pea at a distance of 142 feet from the aforesaid globe. The earth will be a slightly larger pea 215 feet from the globe. Mars will become a rather large pinhead at a distance of 327 feet from the central body. Jupiter, the largest of all the planets—in fact, larger than all the others put together—will assume the respectable dimensions of a moderate-sized orange nearly a quarter of a mile from the globe. Saturn, the beautiful ringed planet, will be represented by a small orange two-fifths of a mile from the mock sun. Uranus will be a full-sized cherry or a small plum three-fourths of a mile from the same object. Neptune, the most remote of all the planets, so far as known, will be fairly indicated by a good-sized plum at a distance of one and one-quarter miles.

If, however, we attempt on the same scale to indicate the distance of the nearest fixed star, we impose a heavy task on our power of imagination. For such a star would be represented by another globe, about two feet in diameter, at a distance of 8000 miles—in other words, at the antipodes, at the other side of the earth, on the end of a line drawn through the earth's center from the globe representing the sun.

In 1838 Bessel succeeded in demonstrating and measuring the parallax of the star known as 61 Cygni, and then, by a protracted series of calculations, in determining the distance of this star as 60,000,000,000 miles. This announcement created a great sensation in the scientific world, and the fortunate Bessel was loaded with congratulations and medals of honor. Then Struve published the results of his observations of the same star, in which he located it at not less than 40,000,000,000 miles. Curiously enough this announcement was received as a confirmation of Bessel's discovery. A matter of 20,000,000,000 miles was a trifle.

However, one star is known to be nearer than 61 Cygni. This is the star known as Alpha Centauri, which is situated in the left foot of the constellation of the Centaur in the southern heavens. It is never visible in northern latitudes, and its distance is about 35,000,000,000 miles. The distance is represented in terms of light years, as explained above, by 3.6—that is to say, if this star should suddenly spring into existence from nothingness we should know nothing about it until nearly four years had passed.

New Railroad Across Tehuantepec.

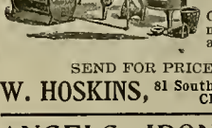
The Tehuantepec railroad, extending due north and south across the isthmus of that name which forms the narrowest part of Mexico, will be regarded as one of the world's most important lines of transportation. It was finished about a year ago, is 122 miles long, and, although its line lies along the least difficult route across the Sierra Madre mountains and from ocean to ocean between Guaymas and Panama, a distance of nearly 2000 miles, its construction was not accomplished without overcoming some very considerable difficulties in engineering. The northern, or gulf, terminus of the Tehuantepec line is Coatzacoalcos, and the southern, or Pacific, port is Salina Cruz. At the latter place there is a harbor with a hard clay bottom and no sand bars, and the Coatzacoalcos river for thirty miles above its mouth has a continuous depth of forty feet, which renders unnecessary the heavy ligtherage expenses which are such an important item at Panama.

The Tehuantepec road was projected and built by the Mexican government, which proposes to expend $15,000,000 in improving the harbors at the two terminals, and it is believed that after these harbors have been deepened and fitted with proper docks and other facilities for loading and discharging cargoes, the new interoceanic route will be sought by a large portion of the commerce between Europe and California, between Atlantic and Pacific ports of the United States, and between most Atlantic and gulf ports on the western coast of Mexico. In addition to this there is every probability that much of the commerce between Europe and the far east which now goes by way of the Suez canal will also be diverted to this route, and that practically all European trade with Chile, Peru and Ecuador will follow along the same line.

This may prove of damage to the Panama railroad, since, although the Panama railroad is less than one-fifth as long as the Tehuantepec line, the use of the latter will shorten the distance between New York and San Francisco, for instance, by about 1500 miles, and between most important European ports and China by about 700 miles. While probably it cannot be said that it will shorten the transportation to most South American ports, yet the superior depth of the harbor at the Tehuantepec terminals, enabling ships to unload directly to the railroad cars and dispensing with lighterage, as already explained, will no doubt make it a more desirable line of commerce to the south of the equator.

It cost $10,000,000 to build the Tehuantepec railroad and occupied fourteen years.

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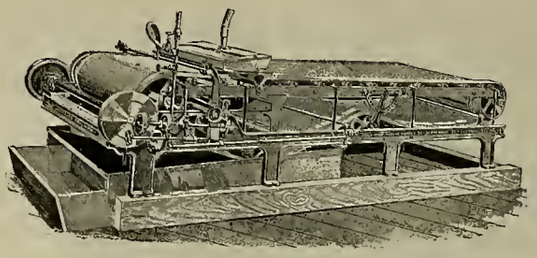
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Owners of Nevada County Reduction Works,
Address: Grass Valley, Nevada County, California.
Inspect and report upon Mineral Properties, Treat Refractory Gold Ores and Concentrates by Chlorination. Furnish Plans for and Superintend Erection of Chlorination Plants, General Analyses of Ores.
References:
Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.
Edward M. Preston, President Citizens' Bank of Nevada City, California.

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We have on hand the following second-hand assay balances: they have been carefully readjusted and are practically as good as new:
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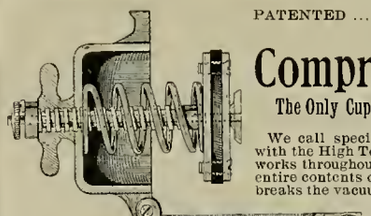
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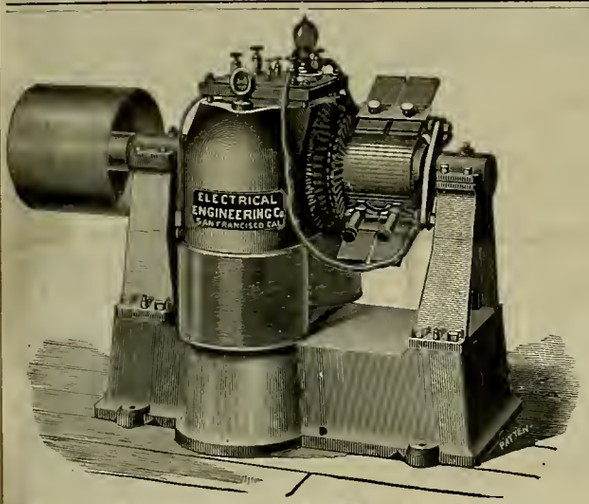
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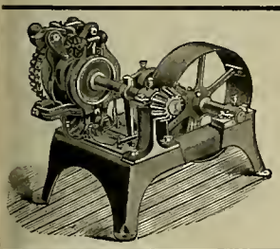
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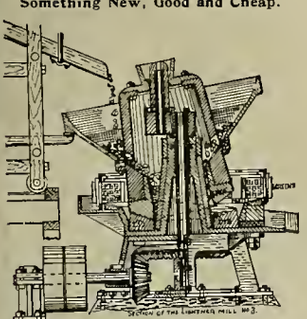
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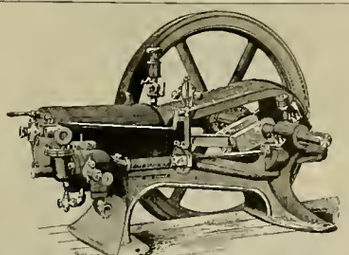
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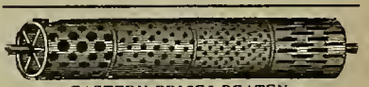
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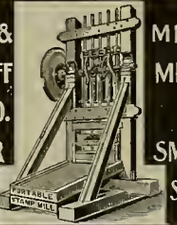
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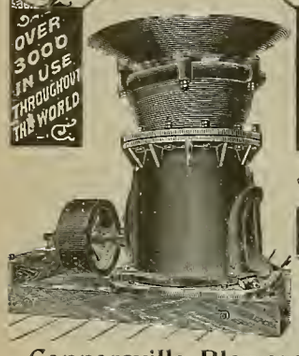
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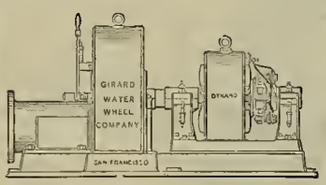
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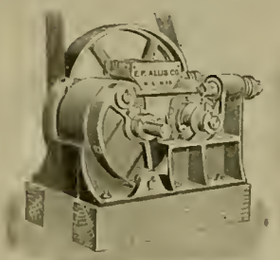
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Can be seen in operation at the Company's works, 132 Main Street, San Francisco.

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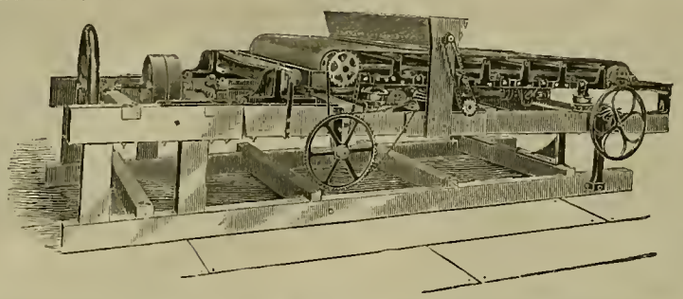
NINETY-FOUR AND ONE-HALF PER CENT SAVED ON ORES DIFFICULT TO CONCENTRATE.

A MARVEL of Simplicity, Durability and Effectiveness combining both Side and End Motion with a Bumping Belt.

SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated. WHILST IN OPERATION

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 1 ft. 6 ins. wide.



FALLS MINE, Dog. SHASTA CO., CAL., May 25th, 1895.

THE McGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully
E. L. BALLOU, Propr. Ballou Reduction Works.

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For Saving Gold

IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.

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Cams, Tappets, Bosses, Roll Shells and Crusher Plates.



STAMP SHOES



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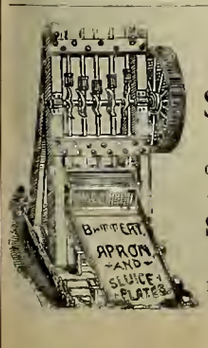


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LIGHT STEEL RAIL.



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Silver Plated Copper Amalgam Plates

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FOR THE CONVENIENCE OF OUR READERS IN THE MINING COUNTIES WE PRINT IN legal size, 12x36 inches, the Mine Bell Signals and Rules provided for in the Voorhies Act, passed by the State Legislature and approved March 8, 1893. The law is entitled "An Act to Establish a Uniform System of Mine Bell Signals to Be Used in All Mines Operated in the State of California, for the Protection of Miners." We furnish these Signals and Rules, printed on cloth so as to withstand dampness, for 50 cents a copy. MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

Market Reports.

The Markets.

SAN FRANCISCO, Sept. 26. 1895.

There was no change in silver during the week, the fact that it holds so steadily to the highest rate quoted for some months being of itself indicative of a steady demand.

Pig iron in all grades is advancing, and is liable to continue doing so.

The steadily declining market for years past has had a tendency to encourage the carrying of as little iron as possible in stock, and this, coupled with the recent severe business depression, has sent the buying movement down to a minimum amount, with the result that many producers went out of business entirely.

With improved conditions everywhere, and considerable of a demand, the amount of pig iron on hand has been steadily decreasing, and it is doubtful whether there is sufficient being made at this time to supply present needs. A great many furnaces and many of the largest producers have sold their entire output for the remainder of the year, and all signs point to a further advance in prices.

New York Metal Market.

NEW YORK, Sept. 26.–PIG IRON—Southern, 11.50@14.50; Northern, 12@12.25.

COPPER — Brokers', 12.20 @ 12.25c; exchange, 12.20@12.25c.

LEAD—Brokers', $3.15; exchange, $3.35.

TIN—Straits, 14.40@14.55c.

SPELTER—Domestic, $4.30.

New York Silver Prices.

NEW YORK, Sept. 26.—Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.
Friday	30½	66⅞	12 25	.....
Saturday	30⅝	66⅞	12 25	3 15
Monday	30½	66¾	.....	3 20
Tuesday	30½	66⅞	.....	.....
Wednesday	30⅝	66⅞	12 25	3 25
Thursday	30¾	66⅞	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.88½
London Merchants	$4.87½
London Sight Bankers	$4.89¼
Refined Silver, per ounce	66⅞c
Mexican Dollars, nominal	54½c

San Francisco Metal Market.

COPPER.			
Bolt	¼ & 5-16, 19c;	⅜ and larger,	19c
Lake Superior Sheathing		21 @	—
Ingot, jobbing		— @	17
Ingot, wholesale		16 @	15
Sheet copper		— @	20
ZINC.			
Sheet		9 @	
LEAD.			
Pig		— @	4 00
Bar		— @	4 10
Sheet		— @	5 35
Pipe		— @	4 85
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes,	"	"	1 45
Buck, Balls and Chilled, do,	"	"	1 45
IRON.			
American Soft		15 00 @	17 00
Pig, per ton		16 00 @	19 00
STEEL.			
English, lb		15 @	17
ANTIMONY.			
Per lb		— @	10
PIG TIN.			
Per lb		15 @	16 00
QUICKSILVER.			
Home trade, per flask		41 00 @	— —
TIN PLATE.			
Per bx		5 25 @	6 00
ZINC.			
Sheet		8¼@	
BORAX.			
Refined, in car lots		— @	5⅛
Refined, in sacks and barrels		— @	5⅝
Powdered, in car lots		— @	5⅞
Concentrated, "		— @	4⅞
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 50
Greta			7 50
Nanaimo			7 00
Gilman			6 50
Seattle			7 00
Coos Bay			5 50
Cannel			8 50
Egg, hard			13 00
Wallsend			7 50
Scotch Splint			8 00
Brymbo			8 00
TO ARRIVE—CARGO LOTS.			
Australian		5 50 @	— —
Liverpool Steam		6 00 @	— —
Scotch Splint		6 50 @	— —
Cardiff		6 50 @	— —
Lehigh Lump		9 00 @	— —
Cumberland		8 50 @	— —
Egg, hard		10 00 @	— —
West Hartley		7 00 @	— —
COKE.			
Gas Companies'		75c ₱	bbl
English, to load		9 00 @	10 00
" spot, in bulk		— — @	13 00
" in sacks		— — @	15 00
Cumberland		9 00 @	— —
NAILS.			
Wire			$2 50
Cut			2 25
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming		17 00 @	— —
Pine		13 00 @	18 00
Spruce		25 00 @	30 00

Mining Share Market.

SAN FRANCISCO, September 26, 1895.

The past week showed sharper manipulation than has characterized the market for several months. Naturally, the change confuses the many, although quite a number of the traders made a handsome turn both on the up and down moves. While shares in the Gold Hill mines weakened off with a break of 33⅓ per cent in Challenge, Confidence, Con. Imperial and Alpha, the other shares in that end only went off from 12½ to 15 per cent, but the latter did not move up much, consequently the weakening was less pronounced. The middle stocks did not do much either up or down, owing to the trading public having but little faith in them. Under the lead of Ophir, the north-end stocks advanced on Monday. This was due to a reported improvement in the upper workings of that mine. The advance was not fully sustained by reason of many operators inclining to realize, yet there seemed to be an undertone of strength even at the slightly lower figures. The decline in Confidence and Challenge was brought about by selling from holders who had information that in the west crosscut of the former the ore had been gone through. Evidently they forgot in their scare that the crosscut passed through over two sets of timber of ore assaying an average of over $40 a ton, mostly gold, besides of there being a strong probability of finding more ore still further west.

From an outside point of view we have every reason to believe that the public will be treated to higher figures than have been reached on the present move, particularly in the shares of the following mines: Yellow Jacket, Challenge, Confidence, Ophir, Union, Mexican and Sierra Nevada. The shares in the other mines will probably be sympathetic for the manipulation now going on points only to those in the above mines. In the Alta group very little business passed, they remaining passively inactive. The same remarks apply to shares in the mines in the Bodie district.

The news from the Comstock mines is of a continued important character, with the most active and promising work being done to the west. This has more special reference to Ophir, Mexican, Union and Sierra Nevada in the north end, and Yellow Jacket and California in the Gold Hill. The work in the two latter has considerable hearing on Challenge. The west crosscut in California passed through the ore found on the drift run from the top of upraise made above the surface tunnel level. There are well informed miners who think they are liable to strike another vein as they work west. Be this as it may there can be no doubt that the ore runs down, and before two weeks it will be struck by the west drift that is being run from the surface tunnel by Confidence. In Yellow Jacket important work is being done, but reliable particulars are hard to get. In Crown Point, Belcher and Kentuck the work points to more time as yet, as does that in Con. Imperial and Alpha, the middle mines, and also Best and Belcher and Gould & Curry. In Ophir, and also in Sierra Nevada, they have a large block of ground blocked out to the west for exploiting, while the work going on in the lower levels of both Ophir and Mexican bears close watching. In Con. Virginia they will soon be ready to drift for the upward continuation of the ore found on the 1100 foot level. In Andes prospecting work has been resumed. Mr. Tangerman, superintendent of the West Con. Virginia, is expected to leave for Virginia City on next Saturday to start a diamond drill to run west from the end of their long west drift. This is to be done for the purpose of draining the water further west, and also to find the distance that the west drift has to be run before striking the west lode. Mr. Tangerman and others that have examined the mine are firmly convinced that the west lode will be found to extend downwards, and that it will be struck by the drill at a depth of over 1600 feet from the surface. If this expectation is realized it will have a direct beneficial bearing on both Ophir and Mexican. The mill has resumed crushing Crown Point and Hale & Norcross ore, about 220 tons will be reduced the forepart of next month.

Work by the different mines owning ground on the Brunswick lode is being pushed as fast as possible. It is thought they will be in a position for exploiting by mining drifts some time in October. In Occidental the work continues somewhat of a dead character, which will be followed before long by more active exploiting. From the Bodie mines there is nothing new or interesting reported either officially or by private correspondence.

The lowest and highest prices paid on regular call from Sept. 20 to Sept. 25, inclusive, were as follows:

	Lowest.	Highest.
Alta	$ 11	.....
Alpha	14	$ 17
Andes	49	62
Belcher	62	66
Best & Belcher	1 10	1 20
Bodie	40	.....
Bullion	19	21
Bulwer	10	.....
Caledonia	14	15
Challenge	76	1 00
Chollar	61	66
Con. Virginia	2 65	2 75
Con. Imperial	03	06
Confidence	2 30	3 00
Crown Point	51	57
Exchequer	05	06
Gould & Curry	54	58
Hale & Norcross	1 50	1 65
Justice	08	09
Kentuck	15	16
Mexican	72	83
Mono	.....	.....
Ophir	1 70	1 95
Overman	21	25
Potosi	60	67
Savage	41	46
Seg. Belcher	11	12
Sierra Nevada	94	1 05
Union	64	71
Utah	10	13
Yellow Jacket	52	63

The following illustrates the changes of the week:

MINES.	Sept. 19.	Sept. 26
Alpha	$ 19	$ 12
Alta Consolidated	.....	.....
Andes	52	57
Belcher	70	60
Best & Belcher	1 15	1 15
Bodie	39	.....
Bullion	21	.....
Challenge	1 05	74
Chollar	61	60
Confidence	3 10	2 15
Consolidated California and Virginia	2 75	2 70
Consolidated New York	.....	.....
Crown Point	58	.....
Exchequer	07	.....
Gould & Curry	58	56
Hale & Norcross	1 60	1 45
Justice	.....	08
Mexican	77	80
Ophir	1 75	1 80
Overman	24	20
Potosi	64	65
Savage	47	40
Sierra Nevada	91	1 00
Union	68	72
Utah	.....	.....
Yellow Jacket	62	45

San Francisco Stock Board Sales.

SAN FRANCISCO, Sept. 26, 1895.

9:30 A. M. SESSION.

100 Belcher	60	300 Mexican	80
550 Challenge	71	300 Ophir	1 80
100 Chollar	60	100 Overman	20
300 Con Cal & Va	2 70	300 Potosi	65
200 Confidence	2 15	100 Sierra Nevada	1 00
7200 Con. Imperial	03	400 Union	72
200 Gould & Curry	56	400 Yellow Jacket	45

SECOND SESSION—2:30 P. M.

300 Ophir	1 80	100 Confidence	2 10
100	1 75	100 Sierra Nevada	98
350 Mexican	78	500	96
350 Best & Belcher	1 10	100	97
50	1 15	100 Justice	08
10	1 15	300 Union	69
200 Savage	40	300 Challenge	73
100 Chollar	58	700	72
600 Hale & Norcross	1 45	900	74
150 Crown Point	45	300 Andes	57
100 Kentuck	13	100	56
100 Alpha	12	1000 Con Imperial	03
1000 Belcher	56		

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from E. C. Hard, in the Terry Hill Mine, near Spanish Ranch, Plumas Co., to impound tailings in an old pit; from Will De Vinny, in the Lone Star Placer Mine, Cromberg, Plumas Co., to impound tailings in Jackson Creek; from Charles Jordan, in the Poor Man's Hydraulic Mine, near Placerville, El Dorado Co., to impound tailings in Taylor's Ravine; and from L. Canato and G. Oueto, in the Eagle Mining Claim, on Dry Creek, Amador Co., to impound tailings below the mine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Oct. 14, 1895, at 1:30 P. M.

1000 FEET FOR $1000.

This can be done with the

CHAMPION DIAMOND CORE DRILL

That we own and desire to sell, having completed prospecting our mine. The plant is complete in every detail, including every tool and diamonds, and is practically new. The 1¼-inch core can be taken out 1000 feet in depth at any angle at the rate of 20 to 50 feet a day. Why sink shafts, drive drifts and fight water to know your mine?

S. V. RYLAND,
Gold Hill Mine ..... Angeles Camp, Cal.

ANCHOR COAL AND DEVELOPMENT COMPANY.

NOTICE OF ANNUAL MEETING.

The annual meeting of the shareholders of the Anchor Coal and Development Company will be held at the office of the Company, No. 632 Market Street, Room 5, San Francisco, California, on MONDAY, the 21st day of October, 1895, at 11 o'clock A. M., for the purpose of electing a Board of Directors for the ensuing year and the transaction of such other business as may come before the meeting. E. D. FARISH, Secretary.

OFFICE.

The shareholders of the Anchor Coal and Development Company will please take notice that the office of the said Company has been removed from 19 Montgomery Street to 632 Market Street, Room 5, as per resolution of the Board of Directors.

AMERICAN CONDENSED MILK COMPANY
WESTERN AMERICAN 99 BRANDS
SAN FRANCISCO

WANTED.—POSITION AS ASSAYER OR Amalgamator. Capable to take charge of mine and mill. Over 25 years experience. C. S. A., 1212 So. O Street, Tacoma, Wash.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Alta S M Co, Nev	50	10c	Sept 16, Oct 21, Nov 11	J E Jacobus, 309 Montgomery
Bodie Con M Co, Cal	18	15c	Aug 13, Sep 16, Oct 7	M E Willis, 309 Montgomery
Con Imperial, Nev	36	1c	Aug 5, Sept 12, Oct 3	C L McCoy, Mills Building
Gray Eagle M Co, Cal	41	5c	Sept 23, Oct 28, Nov 22	W J Gurnett, 308 Pine
Kentuck Con, Nev	11	10c	Aug 6, Sept 10, Oct 1	Aug Waterman, 309 Montgomery
Seg Belcher, Nev	16	10c	Sept 12, Oct 15, Nov 4	E B Holmes, 309 Montgomery
Savage Mining Co, Nev	87	20c	Sept 20, Oct 23, Nov 12	E B Holmes, 309 Montgomery

Assessment Notices.

FAIRFAX VILLA COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Fairfax, Marin County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 23rd day of August, 1895, an assessment, No. 4, of Fifty Dollars per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 56, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 30th day of September, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 21st day of October, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. STADTFELD, JR., Secretary.

Office, Room No. 56, No. 309 Montgomery street, San Francisco, California.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 23d day of August, 1895, an assessment, No. 3, of 2½ cents per share was levied upon the whole of the capital stock of the corporation, both paid and unpaid, payable immediately in United States gold coin to the Secretary, at the office of the company, 213 Jackson Street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 4th day of October, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 28th day of October, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald, Trustee	295	1,000	100 00
M. J. McDonald, Trustee	296	1,000	100 00
M. J. McDonald, Trustee	298	1,000	100 00
M. J. McDonald	455	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
Mrs. Hattie C. Baggs	529	201	20 10
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	393	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	506	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	151	15 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4,000	400 00
Montgomery Baggs	528	100	10 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

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NO DANGER. NO OPERATION. NO PAIN.
No Detention from Business.
QUICKLY! PERFECTLY! PERMANENTLY!

NO PAY UNTIL CURED.

J. C. ANTHONY, M. D.,
San Francisco Offices, Suite 86 and 87, Chronicle Building.

WANTED!

A PRACTICAL PLACER MINER,

Capable of taking charge of hydraulic plant.

Address, stating salary expected, TEMPLE BAR. Kingman, Arizona.

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Not on a navigable stream; in northern California. Good dump; no trouble with tailings; 180 acres of mining ground; 5000 inches of water. Can work eight months in the year. Ample opportunity given a buyer to fully test the property before payment is made. For further details,

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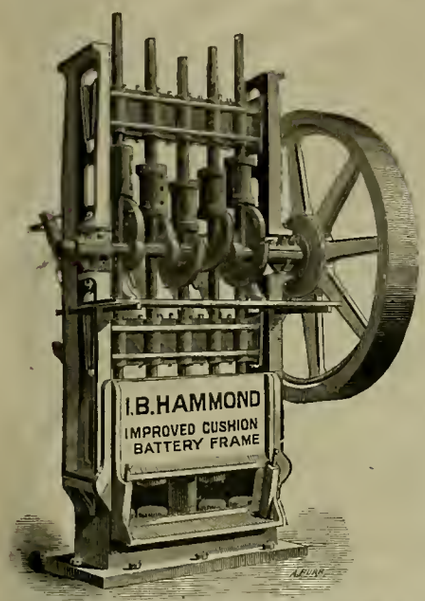
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Improved Self-Contained Cushion-Frame Five-Stamp Mill.

The Improved, Iron-Frame, Self-Contained, Cushion-Frame, Five-Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space. The term "Self-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

FIRST: There is Saved by the Use of This Mill a Large Bill for Heavy Timbers, in Many Instances Obtained at Great Expense and Loss Of Time.

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We refer by permission to Mr. N. A. McMillan, Haines, Oregon, manager of the Blue Mountain Mining Co., at Rock Creek, Or., where ten of our stamp mills are in operation; also to Mr. John S. Miller, Helena, Montana, manager of the Diamond Hill Mining Co., operating one of our forty-stamp mills at their mines at Townsend, Montana.

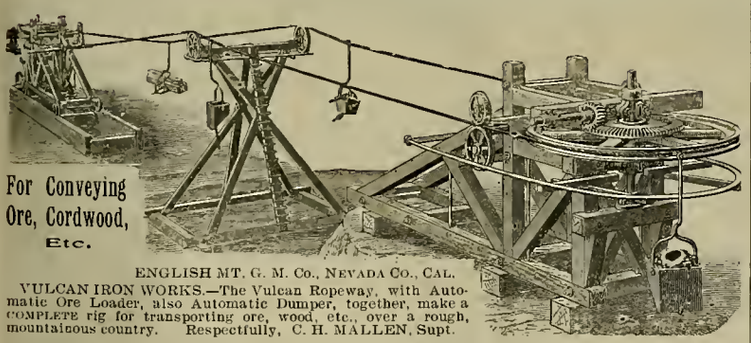
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AUTOMATIC ORE LOADER AND AUTOMATIC DUMPING DEVICE.



For Conveying Ore, Cordwood, Etc.

ENGLISH MT. G. M. Co., NEVADA Co., CAL.

VULCAN IRON WORKS.—The Vulcan Ropeway, with Automatic Ore Loader, also Automatic Dumper, together, make a COMPLETE rig for transporting ore, wood, etc., over a rough, mountainous country. Respectfully, C. H. MALLEN, Supt.

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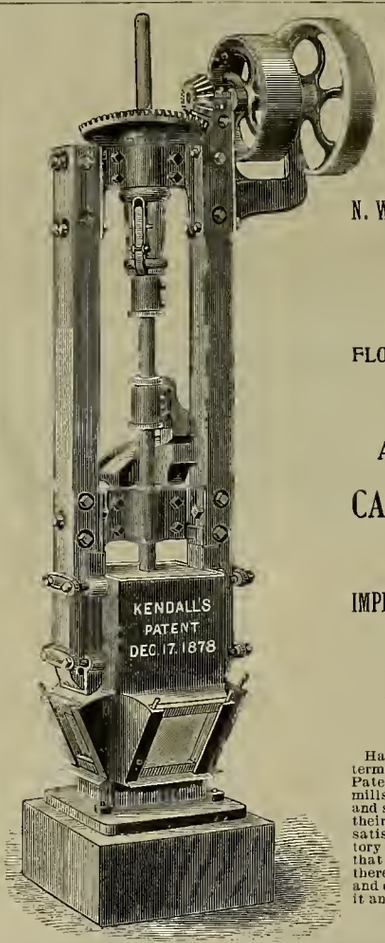
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MARSHUTZ & CANTRELL.

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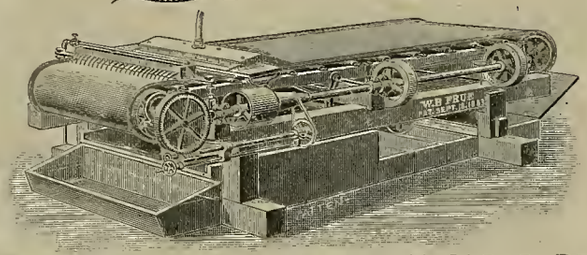
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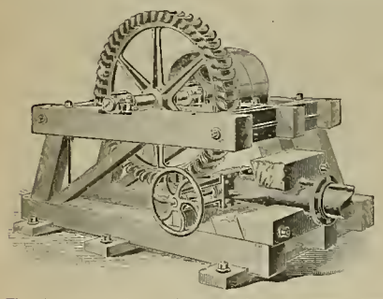
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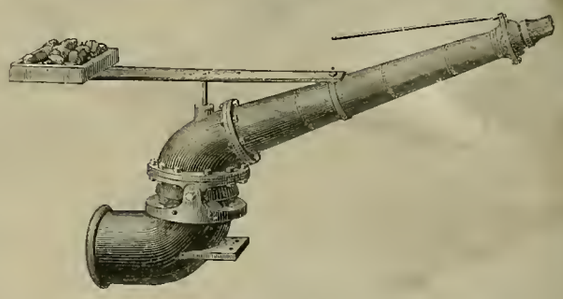
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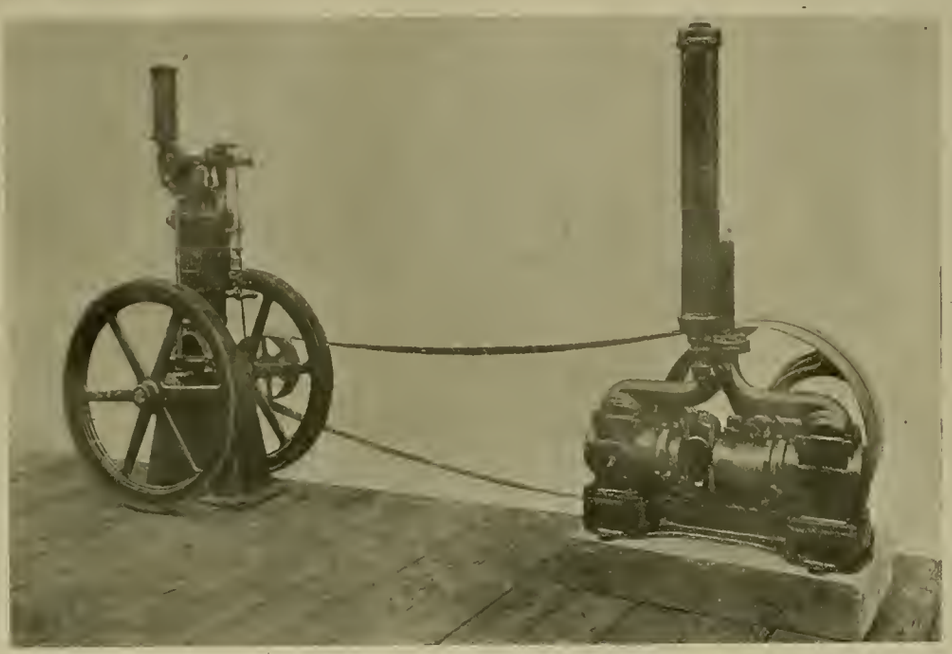
AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 14. SAN FRANCISCO, SATURDAY, OCTOBER 5, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Schilling Gas Engine and Pump.

The upper illustration is of the Golden Gate Gas Engine and Schilling pattern double cylinder, outside packed plunger pump, represented by the makers, Adam Schilling & Sons, 211 and 213 Main street, San Francisco. as sure, economical and satisfactory. The cut is of a 12 H. P. just put in for Mysell & Rollins, with a pump raising fifty gallons per minute against 110 pounds pressure. Special merit is claimed for the Golden Gate Gas Engine in works requiring variable power. A complete regulator is attached to the inlet valves, that opens or shuts them as required to maintain a steady speed and power.

The Golden Gate Engine can use natural gas, water gas, coal gas or gasoline, and can be used where any rotary power is needed.



SCHILLING GAS ENGINE AND PUMP.

CONSIDERABLE prospecting for petroleum is now being done all over the State. Under the mining law, petroleum is classed with placer mines, being subject to the same conditions as to taking up and annual assessment work, the fact that petroleum is producable in paying quantity being a requisite for procurement of a patent.

Oakland Water Co.'s Pipe Line.

The two accompanying engravings are from photographs of an euterprise recently brought to a successful termination by a San Francisco firm—the Oakland Water Co.'s pipe line from Alvarado to Oakland by way of San Leandro. The length of the pipe is about 22 miles, consisting of 30 in. in diameter from the pumping station at Alvarado to 22nd avenue in East Oakland, where two branch lines of 20 in. each run to Oak street, Oakland. The pipe is made of the best American iron, and rivets and everything about it is of American manufacture. In order to facilitate the work a plant was erected by the manufacturers of the pipe, Francis Smith & Co., at San Leandro, complete and well arranged, and from this as a base the line was run both ways. About seven months were occupied in the manufacture and laying of the pipe, and, as an evidence of the class of work done, not a seam or rivet leaked from one end to the other. The pipe is double riveted, chipped and caulked, coated inside and out with asphaltum, and has been subjected to 150 pounds pressure. The firm, whose San Francisco office is 150 Beale street, makes a specialty of this class of work.



READY FOR SHIPMENT.



A PORTION OF THE LINE.

THAT portion of the press of Washington and Montana not controlled by the Northern Pacific Railroad Co. is directing attention to the efforts of the corporation to have confirmed the mineral lands contained in the government grant. The fact that mineral lands are directly and explicitly exempted in the act conveying the lands, and the further fact that the Supreme Court of the United States has overruled the railway company's claim, is not taken into account. The Northwestern Miners' Association, which organizes at Spokane this week, should see to it that the plans of the two adroit lobbyists already at Washington are thoroughly exposed, and that the mineral areas of the Northwest be kept for the people to which they belong.

THE mining interests of Utah are great and growing. The new State will shortly be represented on the American flag by the 45th star. It should be represented in the U. S. Senate by men worthy in every way of the honor. Judge Goodwin of Salt Lake is such a man, and the Utah miners should see to it that he is put in a position to aid them and all other interests of the new commonwealth.

ABSURD statements appear regarding the "prevalence of cholera" in this city. There is no cholera in this city, has not been, and there is not the slightest probability that there will be.

IN addition to the regular edition, 5000 extra copies of the issue of this paper of the 12th inst., and a similar number of the issue of the 19th inst., will be published.

MINING AND SCIENTIFIC PRESS.

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J. F. HALLORAN.....General Manager

San Francisco, October 5, 1895.

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THE property of the Merced Gold Mining Co., in Mariposa Co., this State, consists of forty-three claims. The capital stock of the company is 100,000 shares, quoted in Bostou at present at $43 per share.

ELSEWHERE is published a complete compendium of the gold output of the Witwatersrand, South Africa, district from its inception. The aggregate is 9,367,961 ounces, worth $188,000,000, the amount produced by that portion of the earth's auriferous regions to date. To date California has produced gold to the value of $1,350,000,000.

IT is seriously proposed in British Columbia to levy an export duty on ores. The mining industry of that province is enjoying considerable present activity. Such action would check that prosperity, and, while of immediate benefit to the Canadian Pacific Railway and the enterprises controlled therehy, would be of permanent injury to the province. It would straugle competition, give the miner no choice and destroy the value of many of the mines. The proposition is a short-sighted one and deserves defeat.

AFTER over forty-three years of continuous and successful work, Col. Geo. H. Mendell, the local head of the U. S. army engineering corps, will next Saturday he retired, that being his 64th hirthday. His record is a splendid one for the corps and a most honorable one for himself. To write of his services would constitute a history of the work of the corps on this coast. So far, no intimation has been received as to who will he his successor. Whoever he may he, he will also assume Col. Mendell's present position in the U. S. Dehris Commission. As at present constituted, that Commission is composed of Col. Mendell, Lieut.-Col. Benyaurd, Major Heuer and Lieut. Gillette. Lieut.-Col. Benyaurd is next in command, and has acted as head of the entire department whenever Col. Mendell was absent.

ELABORATE STATEMENTS are received from the East showing that the profit on the recent hond syndicate deal "protecting the U. S. treasury" was only $174,338. Till that disgraceful deal is either forgotten or explained the perpetrators and accomplices can hest avoid disagreeahle reminiscences by remaining silent. Mendacity is evidently only a venial offense in the sight of the self-constituted "protectors" of our national credit. As a plain, hald fact, it is of record that the bonds were issued to the syndicate by the government at $1.04½ and sold at from $1.12½ to $1.17, and the profit made by trading on the credit of the United States was over $9,000,000. Doubtless all concerned are ashamed of it, hut that doesn't justify them in lying about it now. The record is so clear and so recent that the falsehood is evident. The gentlemen who are sending their little pamphlets, "Sound Currency," to this office are wasting some of their profits.

The Proposed Compromise.

On the 1st inst. Mr. W. H. Mills, representing the Land Department of the Central Pacific and California and Oregon Railroad Companies, sent a suhstitute proposition to the Committee on Protection to Mineral Lands, accompanied by a communication in which he expressed a desire for immediate mutual agreement in the matter, named C. E. Uren of Grass Valley as the company's commissioner in case his proposition was accepted, and asked, in the event of affirmative action on the part of the committee, that the commissioner representing the Miners' Association be named at once.

The railroad proposition is drafted as follows:

The Central Pacific Company, hy William H. Mills, its land agent, the first party, and the California Miners' Association, hy the undersigned, its committee for the protection of mineral lands, the second party, have agreed as follows: First—That each party will, within ten days from the date hereof, appoint a reputable and competent person whose duty it shall he to inspect such unpatented lands claimed hy the first party in California as the parties hereto may suhmit to them; and to testify as witnesses in the proper land office of the United States as to the character, for valuable minerals contained, of all the lands inspected hy them; such testimony to he given at hearings ordered, or to be ordered, by the general land officers of the United States, for the ascertainment and determination of the character of said lands.

And herein it is agreed that the persons so to he appointed may, when they concur in so doing, present protests to the General Land Office against the issue of patents to the first party, couveying any lands which have been submitted to, inspected and ascertained hy them to he mineral in character, and the first party hereby consents that hearings may be ordered by the general land officers, in pursuance of such protests.

And herein it is further agreed that the character, for minerals, of all lands suhmitted to and inspected hy them shall he determined hy the testimony of such persons alone, notwithstanding third persons may testify at the same hearing.

Second—That in all cases where the two persons to he appointed, aforesaid, disagree as to the character, for minerals, of any tract or tracts suhmitted to them, they shall appoint a third reputahle and competent person, who shall have the same qualification and duties as the said first named persons; and in all such cases no testimony shall he given, nor action be taken, except hy the two of such persons who have served, and then only in so far as they are agreed.

Third—The first party agrees that it will, at the request of the said persons to he appointed, apply to select any lands suhmitted to them, which are not listed, in order that hearings as to the character thereof may he properly and promply ordered hy the general land officers; and that it will not seek to procure the issue of patent to it for any of the lands submitted to the said persons until after inspection and action hy them, as herein provided. And the second party agrees that it will facilitate in all ways within the powers, influence and persuasion, and will not hy action or countenance obstruct the speedy issuance of patent to the first party for all lands not found by the said persons, or hy the General Land Office decisions rendered in pursuance of their testimony, to he essentially mineral in character.

Fourth—The party of the first part will furnish free railroad transportation for the use of each of the said persons when traveling in the performance of their duties herein provided. Such party is to pay for the services, and all other expenses of the persons which it may appoint in pursuance hereof; and the pay for services and expenses of the said third person to he appointed shall he furnished hy the parties hereto in equal shares.

Fifth—The territory comprising such of the lands within the Central Pacific and California and Oregon land grants of the first party, as shall he submitted to the said persons, may be divided into several divisions, and all the provisions hereof are alike applicable to each subdivision.

It is desired hy the railroad companies that, if the proposition is agreed to, it shall he definitely understood that, in all cases where the commissioners agree, such agreement shall he suhmitted for judicial decision to the registrars and receivers of the districts in which the land in controversy is located, such decision to he final and accepted hy hoth sides, thus making the Government a party to the issue. It is to he noted that in any event the Government would have the last say and the sole right to legally decide the matter.

The Mineral Land Committee met on the afternoon of the 3d, and after very little argument or discussion decided to reject the proposition as offered. The following resolution was adopted hy the committee:

Resolved, That the form of agreement suhmitted to this committee hy William H. Mills of the Central Pacific, etc., he rejected, and that Mr. Mills be informed hy the chairman of this committee that this committee stands upon its proposition suhmitted under date of September 17th, the same to he subject to such minor modifications as shall in no manner interfere with any essential particular.

Ou the 4th a letter was sent to Mr. Mills hy the committee officially acquainting him with its helief that the proposition as received from him was too ambiguous and indefinite for acceptance. It was a concession from the first pronunciamiento, but too one-sided to justify the committee's approval.

California Iron Ores.

An article in last week's issue on "Iron Ores in California" may be supplemented by reference to further analyses of the San Bernardino magnetic and hematite ores hy Henry Wulf, chemist of the Union Iron Works, showing the constituents to be as follows:

MAGNETIC IRON ORE.

Sesquioxide of iron	66.000
Protoxide	25.000
Alumina	2.842
Oxide of manganese	.520
Lime	.720
Magnesia	3.830
Phosphoric anhydride	.006
Sulphuric anhydride	.013
Silica	.840

HEMATITE IRON ORE.

Sesquioxide of iron	81.840
Protoxide	8.250
Alumina	3.200
Oxide of manganese	.750
Lime	.430
Magnesia	3.180
Phosphoric anhydride	.002
Sulphuric anhydride	.117
Silica	1.071

In an article in the Los Angeles *Manufacturer*, St. John Day says these ores can be laid down there for $3 per ton. Ordinarily the price of iron and steel on this coast has been fixed by the Eastern prices with freight added, which ranges from $5 to $10 per ton, depending on the manner of shipment. Tbe irou ore is here, as has been shown, in unlimited quantity and of excellent quality, and the only difficulty in the way of economical smelting it has been the absence of requisite fuel. The employment of mineral oil for the reduction of iron ores is being given present practical test in the reverberatory heating furnaces at the works of the Los Angeles Iron and Steel Company, though the heating or reheating of masses of wrought iron, such as is practiced at these local works, is a totally different operation in respect of the character of the flame to be used as compared with what would be necessary in the application of mineral oils to the smelting or reduction of iron ores in reverberatory furnaces. Mr. Day feels safe in giving the assurance that while a neutral flame *is* necessary for the heating or reheating of scrap, puddle, muck-bar or other masses of rolled or forged iron for the production of plates, bars or forgings, which experience at the local works of the Los Angeles Iron and Steel Company proves to he a matter of every-day practical success, yet it is equally certain that a carbonizing or deoxidizing flame may with equal ease he produced from these oils so as to hurn out or reduce the oxygen from the raw ores placed in similar reverberatory furnaces, thereby at once smelting or reducing them, if so desired, to the metallic condition necessary for being either at once rolled into merchant iron, or which hy the addition of carbonaceous matter in the form of spiegeleisen or ferro-manganese, may be run in the condition of crude cast iron into pig-beds so as to produce at once pig iron from such reverberatory furnaces, or with a lesser quantity of the carbonizing elemeuts and mangauese, cast iuto steel ingots.

THE value of some of our California gold mines received apt illustration this week. Ordinarily, it is a matter that, not concerning the general public, is not given out any more than any other private business, as the producing gold mines of this State are not listed and not subjects of stock jobbing speculation. Last Monday, however, C. D. Lane, of Angels, Calaveras Co., had occasion to qualify as a surety on an appeal bond in a mining suit, and was required to show that he was worth $1,000,000. He produced a deed showing his ownership of a one-third interest in the Utica and Stickles mine and also a statement of the receipts and expenditures of the mine for every month from January, 1893, to September, 1895. The gross receipts were $4,154,026.52 and the expenses $1,683,414.24, leaving a net income of $2,470,612.28 for that period.

NEW PROCESSES are as frequent in announcement as the formation of new mining companies, and often as ephemeral in their duration. French mineralogists, with headquarters in Denver, claim to have succeded in "combiuing cyanide and electricity," and for some months have heen experimenting with that potent compound in laboratory work on the Pelatan - Clerici process. The ore having been ground to an almost impalpable powder is placed in a leaching vat, the bottom of which is a copper plate covered with mercury and connected with a

dynamo, a cyanide solution added, and a central shaft kept revolving for eight or ten hours, when, it is claimed, the freed gold is deposited to the amount of 80 per cent in the case of sulphides. It is now announced that a plant capable of handling fifty tons per day is to be erected at De Lamar, Idaho. The process was patented in this country last October. So far the alleged results have been obtained solely in the laboratory.

A CALIFORNIA MINER who recently returned from South America told the editor of this paper last week that gold claims in some parts of that country, of which much was said regarding their size and richness, would not be looked at by a Chinaman in California. The remark, besides illustrating the richness of California gold mines, calls to mind the fact that Chinese in this State, with their rat-like thrift, extract a great deal of gold. The aggregate amount of the product of Chinese-operated mines runs into the millions. Of course, they never reply to any request for information; but estimates from storekeepers, gold-dust buyers, express agents and bankers indicate that for the twelve months ending December 31, 1894, there was over $1,500,000 produced by Chinese miners in this State. In the one county of Siskiyou alone $325,000 was thus produced; in Trinity, nearly $250,000; and in Placer, $175,000. This applies solely to small claims owned and operated exclusively by Chinese.

Concentrates.

WORK has been resumed at the Inyo Marble Works near Keeler.

THE smelter at Pilot Bay, B. C., closed down temporarily last Tuesday.

WORK to the amount of $100 done in one place will hold a 160-acre placer claim.

THE *Miner* claims that Rossland, B. C., is the most orderly mining town in America.

THE Morning Star Gravel mine, Placer county, has declared dividend No. 58, of $3 per share.

THE Gopher Boulder Company, El Dorado county, have started up their new electric plant.

IN the current number of the Cripple Creek, Col., *Mail* appear forty-one applications for patent.

A FIFTY-CENT ASSESSMENT has been levied upon its members by the Siskiyou Co. Miners' Association.

LINCOLN county is now producing more gold than any other county in Nevada. Esmeralda is second.

DURING the week ending Sept. 29 the deposits of gold at the Denver U. S. assay office aggregated $87,589.57.

S. F. MOUNT, of the Ibex mine, Richfield, Utah, proposes to build a mill, instead of shipping the ore 155 miles.

THE several county miners' associations have nearly all elected delegates to the convention of the 14th inst.

THE pay-roll of the Bunker Hill mine at Wardner, Idaho, for July was $19,000; August, $28,000; September, $38,000.

AT present there are 150 shipping mines at Cripple Creek, Col.; the number of men employed in these properties is 2600.

THE South Eureka Mining Company of Amador county has levied an assessment of 2 cents per share, delinquent November 4th.

THE Hesperides Mining Company has incorporated in this city; capital stock $150,000; of which all but $149,950 has been subscribed.

THE old Cosumnes copper mine, three miles from Henry's, El Dorado Co., is to be reopened and worked. John Theisen has a patent for it.

TO DATE the U. S. Debris Commission has received 155 applications for permits to resume hydraulic mining. Of these, 106 have been granted.

THERE is no United States mining law requiring the recording of notices that assessment work has been done with the Recorder of the district.

THE Marguerite Mining Company has bought the Salsig quartz claim of twenty acres adjoining the Marguerite claim, near Auburn, Placer county.

THE Emma mine, Utah, has been disposed of by its long-time London owners, who are going to buy a gold property in New South Wales for $130,000.

ON the 1st inst. the Napa Consolidated Quicksilver Mining Company paid a quarterly dividend of 10 cents and an extra dividend of 10 cents per share.

STATE ATTORNEY GEN'L HART has decided that the State Debris Commissioners' office was legally created and the incumbent entitled to the salary.

THE Oregon & California Gold Mining Company has incorporated in Portland, Or.; capital, $250,000; incorporators, J. S. Gill, G. H. Dammeier and M. O'Neil.

AT Mullan, Idaho, the Hunter mill and mine is now running two shifts, employing seventy-five men. M. Curran is superintendent, and J. T. Walker foreman.

THE *Messenger* says that the Sierra Co. delegation will attend the coming convention untrammeled and free in every respect, which is probably the case in general.

LAST Monday the Debris Commissioners granted permission to mine by the hydraulic process to John Pasco of the Eureka mine, near Placerville, and to John F. Coe of the Railroad placer mine, near Spanish Flat. Charles Jordan of the Poorman's mine, near Placerville, was given permission to construct dams.

GEO. A. WILLIAMS, superintendent of the Atlanta G. and S. Co. mines, Glen Davies, Idaho, is going to add 10 stamps to the 20-stamp mill there, under instructions from his London principals.

THERE is still talk of compromise of the Hale & Norcross case. Various bases of settlement are announced, but it is probable nothing but cash would be acceptable to the successful contestants.

THE extraordinary demand for copper in the electrical world directs attention to the fact that nearly every mountain county in California has copper ore that at present prices will pay to mine and export.

ACCORDING to the *Mining Industry and Review* there are a host of process mills in Colorado which were conceived in sin and born in iniquity. A lot more were conceived in ignorance and born in incompetency.

IN southeastern Arizona the Copper Queen, at Bisbee, employs 850 men in the mine and smelters. At Clifton and Morenci, the Arizona Copper Company and the Detroit Company together employ nearly 1000 men.

MESSRS. LAKIN, BOTHWELL AND MCCONAUGHY, owning the Lakiu group of mines, Camp Floyd district, Utah, propose to put in a mill and power plant with a capacity of 100 tons per day and leaching tanks with a capacity of sixty tons.

THE Lillooet, Fraser River & Cariboo Gold Fields, Ltd., has organized in London with a subscribed capital of £282,000, of which £175,000 is available for investment in British Columbia mines. F. S. Barnard of Vancouver, B. C., is manager.

THE lead and zinc miners of Iowa, Wiscousin and Missouri, who have for years been at the mercy of the smelters, have organized an association, with headquarters at Joplin, Mo., and will build smelters which they propose to run on the co-operative plan.

THE old employes of the Spotted Horse mine at Maiden, Mont., have foreclosed their liens, and their claims have been taken up by the Bank of Fergus County, which has now obtained possession of that celebrated gold property. The mine has produced millions.

THE Alaska Willougby Gold Mining Company has incorporated here this week; capital $100,000; directors, Stewart and Miller of Fort Bragg, J. Hunter of Vallejo, W. H. Payson of Berkeley and C. L. Tilden of Alameda. So far $99,930 remains to be subscribed.

JAMES GLASS, general manager of the Basin and Bay State Mining Company, has received $100,000 from the Eastern stockholders to rebuild the recently burned works of the Katie mine. The original plant was for 150 tons; the new one will have a 500-ton capacity.

MARMION & PICKETT of Indianapolis, Ind., have bought 735 acres on the middle fork of the American river, east of Georgetown, El Dorado county, and will build a 20-stamp mill on the upper part and hydraulic the lower end. W. C. Green will be their general manager.

THE Elmer Brown Copper Mining and Smelting Co. has incorporated at Grant's Pass, Oregon; capital stock, $900,000; incorporators, W. S. Elmer, Baltimore, Md., Messrs. Wheeler, Brown & Wade, Grant's Pass. The company has recently begun to work a copper producing property in the neighborhood.

THE Butte *Miner* asserts positively that a quarter interest in the Anaconda mine has been sold to the Rothschilds syndicate, the stock has already been placed on the London market by the syndicate, and that the Rothschilds have an option on the remaining three-quarters of the stock and in all probability will purchase it unless the report made by Hamilton Smith be unfavorable.

THE Mountain Mining Company, operating in Shasta county, is expending over half a million dollars, in addition to the $300,000 paid for the property. The new smelters are building at Keswick, five miles from Redding, from which point a narrow-gauge railroad is being built to Iron Mountain, eleven miles. Some of the Iron Mountain ore assays 28 per cent copper. J. A. Hill is the manager for the company.

SPOKANE, Wash., is feeling the good effects of the revival of mining in the Trail creek and other districts. During the past year over $250,000 has been paid out in Spokane in dividends; one mine, the War Eagle, alone paying $132,000. The Le Roi has paid $25,000, the Slocan Star $50,000 and the Cariboo claims large amounts. In addition to these dividends, many claims have been developed out of the proceeds of the mines.

THE Supreme Court of Utah has decided that "work done outside of a mining claim, if done for the purpose and as a means of developing the same, is as available for holding the claim as if done within the boundaries of the claim itself. One general system of work may be devised, well adapted and intended to develop several contiguous claims, and when such is the case, work in furtherance of the system is work on the claims intended to be developed by it."

THE annual convention of the Cal. State Miners' Association will be held at Pioneer Hall, Fourth street, near Market, this city, Monday, October 14th, and will be called to order by President Neff at 10 A. M. Each county organization is entitled to one delegate for each ten members, but the committee on credentials will probably not be arbitrary, and any bona fide representative of mining interests will find no difficulty in securing a seat.

THE work of establishing sign boards on the San Bernardino desert, to indicate the different trails and places where water can be obtained, is to be done. About 100 boards will be needed to mark the various localities and sufficient space will be had thereon to give the needful directions, distances, etc., to enable the traveler on that vast expanse of territory to get from place to place with the least danger of losing his way, and wandering too far from a water supply. These signs will be entirely of metal, of sufficient strength to withstand the fierce prevailing winds, and painted in such colors as will be observable the longest distance.

SUBSTANTIAL profits are enjoyed by many California gold mine owners. In the course of some inquiry regarding his qualifications as a bondsman last week, Mr. Lane, owner of one-third of the Utica mine in Calaveras county, testified that his income from that one source for some time was, monthly, $40,000; Mr. Nevills of the Rawhide mine says the net yield of that property is over $80,000 a month; Major McLaughlin of Butte is credited with securing a monthly yield of $20,000 from the Banner mine.

SILVER, which was as low as 59 a few months ago, is now steady at 67. Notwithstanding its low price, improved methods of treating ore, cheap smelting charges, low freight rates and lower expense on account of wages and supplies, make it practicable in Colorado and elsewhere to work some silver mines at a small profit. Gold monometallism, while lowering the price of silver, has lowered also the price of articles used in silver mining, and thus has slightly neutralized the evil effects of the decline in silver's market value.

TALKING about assessment work at Sheridan, Mont., according to the *Inter-Mountain* one man said he had known claims around there that had been held for 20 years and there was not a hole on them big enough for a man to hide in. "I know of a case," said another, "where there is a claim, on one end of which the graveyard for the town is situated. That man has held that claim for 25 years on nothing but funerals. Every time somebody got buried he would file his statement and claim that the assessment work for that year was done."

A BIG sheet of lead ore was recently discovered at Dubuque, Iowa. The crevice is from three to twenty feet wide and the ore has been cut down to the depth of twenty-five feet and is still going down. This mine has produced 60,000 pounds in eight hours. It gives employment to fifty-five men. The ore at the top of the opening is mixed with rock nine feet high and four feet wide. The solid block mineral makes under this and is from twelve to twenty wide. One block of this ore was broken up in this mine and produced three carloads of pure lead ore, or 120,000 pounds.

THE Commissioner of the general land office has instructed the general land Commissioners in Idaho and Montana to continue their work of classifying mineral lands in that section. The appropriation made for the work has run out, and the Commissioners have asked whether they should continue the work. Commissioner Lamoreaux has studied the wording of the act creating the commission, and believes that the appropriation made was intended to be a salary, and not a stipulated sum for the carrying out of the work. He believes that Congress will make the necessary appropriation in the next deficiency bill to pay the Commissioners the balance due them.

THE Goldbug Placer Mining Company has incorporated at Salt Lake, Utah; capital $500,000, divided into $1 shares. Of the incorporators J. A. Brown of Charlton, Ia., J. C. E. King, P. E. Jones and L. B. Smith of Salt Lake each take 60,000 shares; J. W. Carter and H. V. Carter of Callaban's, Cal., each 30,000 and P. E. Jones, trustee, 200,000 shares. P. E. Jones is president of the company, J. A. Brown vice-president, J. C. E. King treasurer, and La Verne B. Smith secretary. The Blue Gravel, Montezuma, North Star, Green Mountain, Tangle Blue and Rattlesnake placer claims, containing in all 120 acres, on the north fork of Coffee creek, Trinity county this state, are turned into the company at a valuation of $300,000.

IN its mine notices the South African *Financial Record* of August 24th, published at Johannesburg, says, speaking of the Wemmer: "The profit for July has reached the record figure of £13,990, and in well informed quarters it is anticipated that even this will be considerably exceeded in August. The Wemmer shareholders have good cause to feel grateful to the retiring manager, Mr. Emilie Abadie, for the masterly and economical way in which the mine has been handled during the present year, offering, as it does, so remarkable a contrast to the extravagant management of other rich mines in the neighborhood, and to the previous history of the Wemmer itself. It is to be hoped that the shareholders will see fit to make some practical recognition of their obligations to Mr. Abadie, who shortly leaves to take charge of the Buffelsdoorn mine."

GEO. W. GRAYSON, of this city, has brought suit in the U. S. Nevada District Court for the use of that part of the water of the Humboldt river traversing the northern portion of Eureka Co. Some years ago he secured a 10,000-acre tract in that vicinity, and built a dam across the Humboldt to divert the water not already taken up. Subsequently the defendants in this suit bought 100,000 acres below his 10,000, and built a dam above the one he had constructed, and also a six-mile ditch, diverting all the water to their property and leaving the Grayson tract dry. In Nevada the law is that the first settler can divert to his own use as much water from any stream as he can use, conditional on his naming how much he can and will annually consume, a figure that cannot be subsequently changed. Subsequent settlers can use as much of the residue as they please, provided there is no encroachment on the rights of the first settler.

IN the London *Mining World* of the 14th ult. are several full-page prospectuses which illustrate the present mining-share activity in the world's financial metropolis. "The Central Woalth of Nations, L't'd.," in Coolgardie, West Australia, capital £160,000, is offered at the par value of £1 per share, to the amount of 100,000 shares. "The Great Talunga Gold Mine, L't'd.," capital £120,000, has another page; "The Miner's Dream Gold Mines, L't'd.," capital £125,000, has another page. So also with "The Menzies Golden Age Mine, L't'd.," capital £100,000; "The Menzies Pioneers, L't'd.," capital £120,000; "Rand Consols, L't'd.," capital £150,000; "Christmas Reef, Rhodesia, Development Company, L't'd.," capital £100,000, and numerous others. The London *Financial Times* also contains full-page advertisements of company after company now being floated with more or less nebulous plans of engaging in business in the South African mines. The issue of that paper for September 6th has full-page prospectuses of Selukwe-Consolidated, L't'd., capital £170,000; the North White Feather Consolidated Gold Mines, L't'd., capital £225,000; the White Feather Renown Gold Mining Company, L't'd., capital £75,000, in shares of 4s. each; the Bamboo Creek Gold Mining Company, capital £100,000; the Champion Reef Gold Mining Company, capital £150,000; the Lombardy gold mine, capital £64,000; the Dixie Gold Mining Company, capital $85,000. That is certainly a good list of new gold-mining ventures to be advertised in a wholesale fashion in a single issue of a financial paper. The issue of the same paper for the following day contains nearly as many more, and quite different ones. New mining securities are being ground out at the rate of millions of dollars a day. The public is subscribing for them eagerly, and quotations in the market after trading commences go up and up.

The Gold-Silver Veins of Ophir.

In the fourteenth annual report of the U. S. Geological Survey is an illustrated monograph on the Gold-Silver Veins of Ophir, Cal., by Waldemar Lindgren, which gives in considerable detail a history of the district, its yield, its topography, geology, the vein systems, mineralogy, and other interesting data. In that portion of the article relative to the gangue, Mr. Lindgren writes:

The quartz forms practically the only gangue material. When in normal, fresh condition, and not having suffered any changes from chemical or dynamical forces, it is milky white or transparent when occurring in small crystals. It has a glassy, often somewhat greasy, luster, and is composed of relatively large individuals, not intergrown to any extent, but forming a coarse mosaic. Some grains show crystallographic outlines. Gas and fluid inclusions of most irregular outlines fill the grains, and, while sometimes wholly irregularly arranged, usually show a banded or parallel appearance, the bands often continuing across different grains. Calcite sometimes occurs in smaller grains, but is entirely accessory in character. On the Conrad vein and a few others it appears in larger quantities, though still very subordinate to the main quartzose gangue. On the surface, of course, the quartz is often reddish or brownish from decomposed pyrites. The structure of the veins is in most cases distinctly ribboned. It should be observed, however, that the ribbon structure may be primary, due to the deposition; or secondary, due to movements along the vein, by which it has been divided into sheets. The first-named structure is very common and exhibited beautifully, for instance, along the heavy Gold Blossom vein, on which the growth of the layers, beginning from the walls and extending inward, is apparent from the comb structure of the quartz crystals. The clean, white quartz frequently also contains cavities beautifully lined with quartz crystals. The structure of the majority of the Ophir veins is such that one cannot doubt but that they simply represent once open fissures filled with gradually depositing material.

In thin sections of the quartz which has not been subjected to strong pressure subsequent to its deposition the individuals between crossed nicols extinguish uniformity and normally; very frequently, though, the strong pressure which had formed the fissures continued or recurred after the deposition of the quartz, and the gangue subject to such pressure became optically deformed, broken, crushed, and comminuted. The ore from the Gold Blossom shaft shows in a marked way these phenomena in a milder form. The large quartz grains can still be discerned, but each one either shows strong undulous extinction or is broken up in many grains with somewhat different optical orientation. In some parts of the slide the quartz is even crushed and comminuted, and a ragged and crushed fringe usually marks the lines between the grains. The galena, pyrites and zincblende have also been pressed and squeezed in between the quartz grains. Particularly in such pressed quartz the irregularly shaped fluid incisions become extremely abundant. Moving bubbles are sometimes seen, which did not disappear by heating to about 50° C.

The Altered Wall Rock.—The rock contiguous to the quartz veins, whether amphibolite or granodiorite, has usually been subject to a more or less intense alteration. This altered wall rock, to which the miners incorrectly give the term "gouge," is from a few inches to a few feet wide. Only rarely does the unaltered wall rock lie up against the vein.

The process and the final product of this alteration are similar in both rocks, and it may in general be characterized as a conversion into an aggregate composed of white mica, carbonates and pyrites, effervescing with cold hydrochloric acid. The amphibolite is changed into a grayish or white, fine-grained rock with somewhat greasy luster and feeling on the cleavage planes. It is usually filled with small cubes of pyrite. The mineral occurs much more abundantly in the altered wall rock than in the veins. The microscopical appearance is that of a sometimes coarse but on the whole extremely fine and felted aggregate of wavy or straight fibers of sericitic muscovite and grains of a carbonate, predominatingly pure calcite. Large, sharp crystals of pyrite are imbedded in this aggregate. Of other minerals there is a small amount of a colorless substance of undulous extinction and low interference colors, probably a variety of chlorite; further, white opaque grains which almost certainly are titanite altered from the titanic iron ore in the amphibolite. The mass is sometimes traversed by small veins of quartz which contain rhombohedrons of calcite.

The granodiorite altered in the same manner becomes a grayish green rock of slightly greasy luster and feeling. In the less profoundly changed rock the hornblende crystals are still visible as dark patches; but with increasing alteration a more uniform medium-grained product is the result. Pyrite is, as usual, very abundant, and foils of a green chlorite may sometimes be seen. This chlorite is distinctly biaxial with an optical angle of about 20°.

In thin section the granitic structure is usually still apparent. The former hornblende is indicated by foils of chlorite and an opaque grayish brown mineral, most probably titanite. Some quartz grains showing undulous structure still remain, and the outlines of some feldspar grains are still visible, but practically the whole mass is altered to an aggregate of calcite and white mica, in which the calcite often forms triangular or polygonal masses bordered by the straight mica foils. The remaining quartz grains show a corrosion by the secondary mica calcite aggregate, long foils of muscovite reaching into the quartz grains at some places. Crystals of apatite remain fresh. Some distinct leucoxene, inclosing unaltered grains of titanic iron ore, are also noticed. In some specimens secondary aggregates of quartz also occur.

The altered wall rock, in places at least, contains gold and silver. A sample from the Mina Rica gave 0.125 ounces Au. and 0.250 ounces Ag., or about $2.75 to the ton. The decomposed diorite from near the Gold Blossom vein northwest of the tunnel gave trace of Au. and 0.050 ounces Ag. to the ton. The altered amphibolite from the Gold Blossom tunnel gave 0.012 Au. and 0.098 ounces Ag. to the ton. Wall rock from the Gold Blossom shaft adjoining quartz, which assayed 0.5 ounces Au. and 2.15 ounces Ag., or $12 to the ton, gave trace of Au. and 0.20 ounces Ag. In all cases the altered rock was free from vein quartz.

* * * * *

The extensive carbonatization of the Ophir wall rock is very remarkable indeed, especially as the main fissures are almost completely filled with quartz and contain very little or no carbonates. In the researches of Sandberger and v. Groddeck, the process is usually rather a silicification instead of a carbonatization, even in veins containing large quantities of carbonates. A gneiss, largely converted into carbonates, is mentioned by Sandberger as an exceptional occurrence.

I think future investigation will show that this carbonatization of the wall rocks is a process which has occurred very frequently during the forming of the California quartz veins. The fact that each vein and veinlet is surrounded by a distinct, bleached and altered zone of greater or less extent—in the small stringers sometimes only a fraction of an inch wide—appears to me to indicate, beyond doubt, that the veins were filled with solutions acting with a certain intensity on the walls; in other words, that there can be no question of surface waters gradually percolating through the wall rock and depositing there dissolved substances, but rather of strong mineral solutions circulating in the fissures.

Some specimens of vein quartz show, on the faces adjoining the walls, small but distinct pseudomorphs of quartz after calcite. Taken into consideration with the carbonatization of the wall rock this may mean that the character of the solutions changed during the process of formation of the veins from predominatingly carbonated to siliceous.

Two facts referred to above should be accentuated: first, that the iron pyrites are more abundant in the altered wall rock than in the veins, and this not only in the iron belts of the amphibolite, but also in rocks originally not containing any pyrites; second, that although the wall rocks have been so radically altered by the solutions in the fissure, very little good is contained in them. They are, however, as shown above, not wholly impervious to the gold and silver solutions.

Distribution of Gold and Silver in the Veins.—It may be said with considerable confidence, though, of course, a more extended series of assays would be desirable, that all the quartz veins in the Ophir district carry gold and silver in notable though often minute quantities. The proportion of gold to silver varies from 1:1 to 1:10 or more by weight; the silver always predominates by weight, though not by value. A large portion of the silver is contained in the sulphurets, which usually contain much more silver in proportion than the ore, but the bullion obtained by ordinary plate amalgamation is only from 500 to 700 fine.

The richer ore in the pay shoots is nearly always characterized by more sulphurets than usual in the poor quartz. Galena is especially considered a good indication. The very crystalline and bright quartz in which no sulphurets occur is usually considered poor; in general this perhaps, holds good, but it may be said to be a most difficult feat to tell the approximate value of the quartz by its appearance. A specimen of very clean and crystalline quartz free from any sulphurets from the Rocky ridge gave, in spite of its very unpromising appearance, 0.187 ounces Au. and 0.263 ounces Ag., or about $4 per ton.

In the granodiorite the richer ore bodies are of considerable extent and their width and dip are not always known; still there are some, as the Crater hill ore shoot, for instance, which distinctly dip eastward in the plane of the vein. It is worthy of note that at many of them there is an amphibolitic dike rock adjoining the vein. The veins in which this is notable were shut down during 1892 and offered no opportunity of investigating this relation; it would seem, however, as if the dikes were of such small extent that the metals in the ore shoots could hardly have been derived from them alone. Moreover, one of the largest ore bodies, that of Crater hill, occurred without any such adjoining dikes, and several other smaller rich shoots have also been found at various places in the granodiorite without them.

In the veins of the amphibolite area the richer ore shoots are, on the whole, of small extent, though more extensive bodies of milling ore may occur. The usual width of these chimneys is from a few feet up to 50 or 60. As already stated, they dip eastward at varying angles on the plane of the vein, and the richest shoots are usually found in the crossing of the vein with the iron belts. In this case the ore bodies have certainly been enriched by leaching from the auriferous sulphides of the amphibolite. Pockets or rich ore shoots are also sometimes found at the crossing of the two veins, such as at the junction of the Little and Big Doig and at the junction of Good Easter with Morning Star. The rich ore shoots are usually of small depth, seldom exceeding 100 feet, but others may come in at any place when the vein is explored.

There is an accepted dogma of many miners that "the gold in the veins is a surface formation," or that "gold veins invariably become poorer as the distance from the surface increases." These are views which are based on a misconception of the data involved. It is correct to say that *one and the same ore shoot seldom continues beyond a depth of a thousand feet or thereabouts*, but thorough prospecting of the same vein would, in all probability, develop new ore bodies in other places on the level in which the old one was found to thin out. Of course it is not in every case certain that such thorough exploration of the vein would be a paying investment. When the ore shoot found at the surface gives out, the mine is often abandoned through lack of funds. It seems to be a characteristic of all gold quartz to form rich chimneys of limited extent, irregularly distributed in the plane of the ledge. There is a curious misconception abroad that the present surface is also the surface of the period when the veins were formed. Not only is the present surface cut down and eroded to a considerable extent, since the late Tertiary time when the auriferous gravels were deposited, but there is every probability that the surface at the time of the formation of the veins was far above the Tertiary surface.

The ore bodies of to-day are thus probably far below the croppings at the time the fissures were filled, provided that they reached the surface. Rich ore bodies now occur, as in the Washington, Nevada county, mines, about 3000 feet below the Neocene surface; they occur at the present surface, and they certainly also did occur above the Neocene surface, as evidenced by the rich Tertiary gravel. The veins may, on the whole, have been richer near the original surface, or perhaps only more numerous, but the occurrence of rich ore bodies at a depth of several thousand feet below it certainly appears to indicate that the limit where gold was no longer deposited from its solutions has not by any means been reached in our present mines.

Some Legal Points.

When one of the two innocent persons—that is, persons each guiltless of an intentional moral wrong—must suffer a loss, it must be borne by that one of them, who, by his conduct, acts, or omissions has rendered the injury possible.

Where a number of individuals assume to act in a corporate capacity in a State where they have not been clothed with corporate existence and authority, they cannot there be recognized as a legally constituted corporation, though they may have been duly incorporated in another State; and such persons, in the State where they assume corporate capacity, will be treated as, and held to the responsibility of partners, both in courts of law and equity.

The authorities leave no doubt that construction contracts, in which the contractor stipulates that the engineer or architect of the owner shall finally and conclusively decide, as between him and the owner, what amount of work has been done; and its character, and the amount to be paid therefor under the contract, are legal, and should be enforced.

To render a professed agent liable in damages to the person dealing with him on the ground of want of authority to bind the party for whom he assumed to act, such person must have dealt with him in ignorance of want of authority upon the faith that the agent possessed the authority assumed. Hence, when the agent, acting in good faith, fully discloses to the other party, at the time, all the facts and circumstances touching the authority under which he assumes to act, so that such party is fully informed as to the existence and extent of his authority, the agent cannot be held.

When I see a St. Louis foundryman coming to Chicago and secure a large order for foundry work by under-bidding the local shops and on the next train see a Chicago man going down to get back at him, I feel mighty certain the moulders' wages are not going to be raised until after that contract is filled. I feel sure they will be speeded up to the utmost on such close transactions.—Foundry.

Critical Periods in the History of the Earth.*

NUMBER VI—CONCLUDED.

By JOSEPH LE CONTE, of the University of California.

Re-isolation.—Lastly there come re-isolations of the mixed faunas and floras in their new positions; and geographical diversity again commences and continues to increase without limit in proportion to the time and degree of isolation.

Thus in the history of the earth there have been alternate periods of minglings and re-isolations of faunas and floras; of effacement, and re-establishment of geographical diversity. Every period of mingling has increased the force and quickened the rate of evolution and the diversity of organic forms.

As already shown, the glacial period is the last of these critical periods of migrations, minglings, struggles, and the present a period of re-isolations and increasing geographical diversity (except in so far as interfered with by man) and of readjustment of the whole organic kingdom to the dominant type, man. Therefore the glacial period furnishes the key to the present geographical distribution of species, especially among the higher forms, and conversely the present geographical distribution of species furnishes a key to the changes in physical geography and the directions of migrations of species during that critical period.

SUDDENNESS OF CHANGES AND RARITY OF TRANSITIONAL FORMS.

There are many important questions suggested by the foregoing discussion. Chief among these and the only one I now touch, is the question of the cause of the suddenness of the appearance of new organic forms, and the extreme rarity of transitional forms or connecting links at all times, but especially during the critical periods.

As already said, the greatest and most rapid of all these changes is that which occurred in the critical period between the Palæozoic and Mesozoic. We may therefore take this as the type in this regard. It is almost impossible to exaggerate the greatness of the change which took place here. Passing from the one era to the other is like going from one world into another. How shall we aecount for this great and apparently sudden change?

Lost Records.—The first and greatest cause, especially of the suddenness, is, of course, the loss of record. Certain leaves of the book of time are missing, and when we come to read again, the subject matter of the volume is greatly changed. This accounts for the absolute suddenness in some, but not for the greatness of the change, for this is out of all proportion to the lost interval of time. Therefore we must admit farther:

Rapid Steps in Evolution.—The steps of evolution were exceptionally rapid at this time. We have ready given the causes of this more rapid movement. But even when the record is recovered, as for example, in India, Australia, etc., we find still that connecting links between successive forms are rare—links are usually missing. Therefore it is necessary to remember also that there are

Few Generations Represented.—The changes being more than usually rapid, the number of generations necessary to accomplish a certain amount of change, *i. e.*, to transform one species into another, were comparatively few. Therefore when we remember that fossils were but a small fraction of the actual number of individuals living at any time, the likelihood of finding transitional forms is diminished to that extent. Again, add to this the fact of

Few Individuals in Each Generation.—The conditions must have been unfavorable to fullness of life. The changes in the environment were rapid, and therefore adaptations of organisms to the environment must have been imperfect. In a word, critical periods are hard times. But hard times react and produce less reproductive fertility, and therefore fewer individuals in each generation. Therefore critical periods are characterized by poverty of fossils, even when the record is recovered.

Migrations and Consequent Unconformity of Faunas.—Last of all among the causes, we must not forget migrations, which, aside from the rapid changes produced by severer struggles, produce also unconformity of faunas and floras, and therefore an appearance of suddenness of change in any one place. Such changes of species by migrations, although most conspicuous in critical periods, take place locally even in the quietest times and the most conformable strata, by changes of bottom from sand to clay or lime, or vice versa, produced by a change of currents, or slight changes of shore line.

Effect of Specialized and Generalized Forms.—Again, as to the nature of the process of change in the changing organism itself: Long continued prosperous times with unchanging conditions give rise to highly specialized forms, perfectly adapted to these conditions, but correspondingly unadapted to other conditions, in other words, to rigid forms, rigid through the accumulation of heredity for many successive generations on the same point. Generalized forms, on the contrary, are less perfectly adapted to any one set of conditions, but more easily adaptable to many kinds of conditions. They are a sort of Jack-of-all-trades and not very good at any. These are therefore more plastic to the moulding influence of a changing environment. Therefore long continued periods of quiet give rise to many specialized dominant forms, perfectly and rigidly adapted to these conditions. During the following critical period, these domiuant forms are unable to adapt themselves to new conditions. Too rigid to change with the changing times, they are destroyed, while only the few and less conspicuous generalized, and therefore plastic forms save themselves by modifications in many directions adapted to the new conditions. Thus all the old forms may quickly disappear, some by extinction, and some by modification into new forms, but all the new forms come only by modification of the old.

Periodic Law Universal.—But again, and lastly: Even in most prosperous times, and in the most continuous strata, with every evidence of great fullness of life, and when, therefore, the changes of species were slow and continuous, even under these most favorable conditions, still the links between successive species are rare. In nearly all cases progressive changes seem to take place by substitution of one species for another (of course following the line of evolution), rather than a transformatiou of one species into another. The same thing is observed in geographical distribution of species. In fact, there is great similarity in the laws of geographical and geological distribution of species—the distributiou in space and the distribution in time. Critical periods with their unconformities in the latter, correspond to great physical barriers in the former, for in both they separate sharply distinct faunas and floras. On the other hand, conformity with its gradual changes of species in the one corresponds with gradual changes of physical conditions in latitude and corresponding changes in species when there are no barriers. In both cases the changes of species are gradual, indeed, but usually, though not always, by substitution rather than by transformation. In the case of geographical distribution we easily account for this by the dropping out of intermediate forms in the struggle for life in all cases, and by migratious in many cases. How shall we account for it in the geological distribution?

Of course, in perfectly conformable strata, in case of change of material of the strata, we account for it largely by local migrations through change of bottoms. But the same is often true even in a continuous unchanged stratum. Of course, again we may attribute it, as Darwin, and many since Darwin have done, to the extreme fragmentariness of the geological record. But even when the record is complete, as it sometimes is, and the number of fossil species is fairly comparable to the number of living species in similar area and time, still the same fact is observed. There must be some other cause inherent in the very nature of the process of evolution itself. On this most difficult subject I throw out the following suggestions:—

I have already said that while the forces and laws of nature are uniform in their operation, yet phenomena, being usually under the influence of two opposite forces, one tending to change, the other to permanency, the one progressive, the other conservative, are nearly always paroxysmal. Resistance at first prevails and there is little or no change; but forces of change are meanwhile accumulating until finally resistance gives way and conspicuous changes take place rapidly. This might, if necessary, be illustrated from every realm of nature, but it is well recognized that all phenomena are more or less periodic or paroxysmal. Now in the case here in hand, the resistance or conservative force is heredity and the force tending to change or the progressive force is the pressure of a changing environment, physical and organic. Under these conditions, progressive movement or evolution must be more or less paroxysmal. By heredity the species resist change until at last the want of harmony with the environment becomes so great that the species must either change or die. Some accept the one alternative and some the other; the generalized forms change, the specialized die. When the change begins, I imagine, it goes on rapidly until equilibrium is again restored. The change being comparatively rapid is completed in a few generations. The steps of change are therefore represented by comparatively few individuals on that account. But again the times of change would have all the peculiarities of hard times. Not, indeed, hard times for all species as are critical periods, but for some particular species. Therefore the steps of change are represented not only by a few generations but also by comparatively few individuals in each generation. For both of these reasons, therefore, there would be a comparative poverty of fossils of intermediate forms until the neeessary change is completed, adaptation is restored, and life becomes abundant again.

In a word it seems to me impossible to account for the phenomena of the evolution of organic kingdom, and also for the rarity of transitional forms, unless we recognize a law of paroxysms in evolution, the greatest ones constituting critical periods and marking the primary divisions of time, the lesser ones the subdivisions; but the law entering into even the minutest details of suecession of species in the most tranquil and prosperous times.

CONCLUDING REFLECTIONS.

In couclusion, permit me to say, I have tried to give what seems to me, under the present lights, the most rational view coneeruing the primary and secondary divisions of geological history. I cannot for a momeut hope that the view here presented is final or even nearly so. There must coutinue to be evolution of thought on this as on every subject. In science, the last word is never said on any subject. Old views must give way to new, but let us not lose sight of the germs of truth eontained in the old. Evolution of thought must, indeed, continue, but let us remember that evolution is by modification, not by destructions and recreations. Ideas are like species. In the evolution of thought some, indeed, become extinct and leave no progeny, but some are transformed into new, and all the new come only by such trausformation of the old. All I can hope is that those expressed above are among the plastic ones, which will not be destroyed but chauged into higher forms.

* Bulletin No. 11, of the Department of Geology.

The Gold Output from the Witwatersrand, South Africa, Mines.

MONTH.	1887	1888	1889	1890	1891	1892	1893	1894	1895	Total to Sept. 1, 1895.
	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces. Year.
January	.....	7,398	25,506	35,097	53,205	81,560	108,371	140,811	177,463	....
February	.....	12,180	22,157	30,887	50,079	86,649	93,252	151,870	160,205	....
March	.....	11,936	27,019	37,780	52,910	93,245	111,471	165,372	184,945	....
April	.....	14,146	27,021	38,937	50,372	95,582	112,653	168,175	180,323	23,155—1887
May	887	13,397	35,028	38,836	51,673	99,431	116,011	169,773	194,580	308,122—1888
June	731	12,773	30,878	37,419	55,803	103,252	122,907	168,102	200,941	360,557—1889
July	210	16,687	31,091	39,457	51,924	101,270	126,160	167,053	199,453	101,817—1890
August	1,160	18,616	30,520	42,861	59,070	102,322	136,060	174,077	203,573	720,238—1891
September	1,936	20,212	34,113	45,486	65,602	107,852	120,585	176,707	....	1,210,897—1892
October	1,029	27,165	32,214	45,240	72,793	112,167	130,682	173,378	..... .	1,478,473—1893
November	5,463	26,827	33,722	46,783	73,304	100,795	138,640	175,304	..... .	2,024,159—1894
December	8,457	26,781	30,050	50,352	80,323	117,718	146,357	182,104	.....	1,516,573—1895
Totals	23,155	208,122	369,557	101,817	720,238	1,210,897	1,478,473	2,024,159	1,516,573	9,367,961

THERE was a wonderful run on the New York Central R. R. on Sept. 11th, when the distauce of 436¼ miles from New York to East Buffalo was covered in 407 minutes, exclusive of stops, averaging 64.348 miles an hour; or iuclusive of stops in 414.27 minutes, averaging 63.192 miles per hour. This is the greatest example of sustained speed for a long distance ever given in this country and probably in the world; although the American representative of the London and Northwesteru railway writes that in the great race from London to Aberdeen on August 22, a distance of 540 miles, the West Coast train averaged 64.158 miles an hour exclusive of stops and 63.281 miles an hour iuclusive of stops, which, if eorrect, would show a very slightly higher average, .089 of a mile an hour exclusive of stops, although the American rate inclusive of stops is still ahead. But it must be remembered that while the English run was more than 100 miles longer than the American, the New York Central train of four cars weighed 232½ tons, while the West Coast train of three cars weighed only 68 tons, a great handicap of 164½ tons against the American race.

A MINIATURE world has been made by four French scientists, and is being exhibited at Paris. The globe is 42 feet in diameter, and has painted upon its outsides all known details of the earth's geography. The building in which it has been placed is eight-sided, has an iron and glass dome and is well provided with elevators and stairways, so that a visitor can easily examine "all parts of the world." The globe weighs 13 tons, but is so nicely balanced that it can be rotated by a small hand wheel. The surface area is 525 square feet, which is sufficient to exhibit all the mountains, rivers, islands, and cities, and even the principal thoroughfares of the latter.

THAT was rather an amusing circumstance related by a Mr. Wanner at the last meetiug of the Philadelphia Foundrymen's Association as showing a side of humau nature that is only too often displayed. A pipe foundryman had purchased a large amount of pig iron at the prices ruling early in the year when some grades sold down near $9 per ton. Afterwards he took an order for a large amount of heavy water pipe at a price that would have netted him less per ton than a re-sale of his pig iron would have brought him. Surely the desire for competition or the craving for orders at any price must amount almost to a mania with some people.

Mining Summary.

CALIFORNIA.

Amador.

MIDDLE BAR AND HUNT'S GULCH.—In Hunt's Gulch ten stamps are running on ore taken from the Amador Queen mine, which is being crushed hy ten stamps in the sixty-stamp mill of the Amador Gold Field's mill hy James E. Dye.

Eight men are at work on the Doyle mine sinking a new shaft. Mr. Moore of Sonora is the superintendent.

THE NEW YORK BONDED.—*Record:* G. W. Andersou of the New York mine, three miles down Jackson creek, has sold or bonded that mine to San Francisco parties, who will in a short time commence operating upon a large scale, under the name of the Evening Star Gold mine, and will put up a mill and work it this winter, and they feel confident of opening up a rich mine hy sinking deep and getting rich rock that will pay well.

THE AMADOR QUEEN. — *Republican:* Ten stamps of the Amador Queen mill have hee n started on refuse rock. This is to get the mill in good working shape for the test crushing, which will commence next week. It is proposed to run through about 300 tons of ore taken from the bottom of the shaft. The plates are resilvered, and everything has heen done to make the test a fair one as far as the gold-yielding properties of the rock hy mill process are concerned. The ledge is large enough to keep forty or sixty stamps running steadily. If the rock mills $3 per ton a hig mining industry will he developed at this point.

AT THE BAY STATE.—At the Bay State mine, Plymouth district, the mill is running to its full capacity, crushing ahout 20 tons per day. There are four ore chutes on the 600 level to the north and south of the shaft, with a total length of 270 feet and an average width of 6 feet. It is believed that all these ore bodies will unite as greater depth is attained. East of this there is another very heavy hody of quartz in which a crosscut was run to the 300 level, penetrating the ledge 14 feet without encountering the hanging wall. The rock is very hard and compact, and for this reason no further work will he done in that direction until power drills are put in position.

Butte.

AT ENTERPRISE.—E. W. Slater has five men working on the E. W. quartz mine, while two tunnels have heen driven on the gravel mine he owns lower down the South Fork. One tunnel is in 225 feet and the other is in 900 feet.

Rothwell & Bachman, who own the North Star quartz mine above Enterprise, are making arrangements to put in a ten-stamp mill.

THE GOLDBANK MINE.—*Mercury:* At the Goldhank mine, near Forhestown, work in the tunnel has heen suspeuded in order to allow the laying of a new foundation for the air compressor and other machinery. It is thought this will take ahout a month's time. The tunnel is now in 1050 feet, and it is thought that 150 feet farther will tap the ledge.

Calaveras.

GENERAL IMPROVEMENT.—*Chronicle:* A water power hoist and a ten-stamp mill are now in process of erection on the Keystone mine uear Railroad.

The water power hoist, which is in course of constructiou at the Infernal gravel mine, is nearly completed, and will he in running order in ahout ten days.

M. Provard, owner of the Vorlander mine on the Mokelume river at Middle Bar, intends putting up a steam hoist.

The Gwin mine shaft has now reached a depth of 1,000 feet. The sixty-horse power engine is nearly completed and will be ready to run in a short time.

TERMS OF THE TULLOCH SALE.—The Brown, or Tulloch mine, at Alhany Flat was sold for $50,000 on the following terms: $10,000 cash down, the remaining $40,000 to be paid on or before March 8th, 1896. The parties to receive payment are Mrs. J. C. Tulloch and A. Magruder, who share a like interest in the property.

The Pure Quill mine is being worked with two shifts of men, who are employed to take out ore to he worked as a test. Should the test prove satisfactory the Godhe Co. will open up the property in proper shape.

The Tiberghien mine at Smith's Flat has heen sold to James Smadeke for $5000. One thousand dollars have been paid, aud Mr. Smadeke agrees to pay the balance in monthly installments of $1000 each.

Lassen.

LONE PINE MINE.—Judge Goodwin, and his son, W. N. Goodwin, of Susauville, have bought a ten-stamp quartz mill of D. McIntyre, Greeuville, to he delivered at the Loue Pine mine. The Lone Pine mine is at the foot of Diamoud mouutain. The shaft is down ahout 150 feet and the vein of ore is hetween three and four feet in width. It prospects $10 per ton.

Mariposa.

THE MERCED G. M. CO.—Under date of Sept. 21, W. C. Ralston writes to the *Engineering and Mining Journal*, of New York, regarding this mine, his letter appearing in that journal of date Sept. 28, as follows:

"In the last two or three editions of your valuable journal have appeared letters condemning and criticising the Merced gold mine, which is situated at Coulterville, in Mariposa county, California. Your last issue contains a letter, signed by 'C. E.,' dated Kansas City, Mo., Sept. 16, 1895, and, with your kind permission, I will reply to the same.

"Wheu 'C. E.' says that 'he believes this mine (the Merced) the most daugerous mining investment that has been offered to the public in this country in many a day,' he makes a statement which is not true. Pardon my flat contradiction, but I am speaking from actual knowledge of the property, although not interested in the stock in any way. The Merced mine (formerly known as and called the Seth Cook mines) is on the famous 'Mother Lode' of California, and comprises several mining locations. The lode here is as wide as it is anywhere, and more free gold was visihle on the croppings than in almost any other section. That the Cooks worked it at a loss is no proof of its not heing a valuahle property, for we all know the history of the Utica, the Kennedy, the Keystone and other mines, which were not worked at a profit until depth was attaiued. 'C. E.' evidently has never visited Coulterville, nor do I helieve that he is posted on the history of the Mother Lode in California. Every mining expert of known repute, who has examined the Merced properties, has stated that they contained very large shoots of low grade ore. To he sure, there is some worthless ore in a 30-foot ledge. That is always the case. I would he pleased to hear the name of any expert who has examined the Merced properties and who, speaking of them as an investment, says they are 'too poor to pay and too rich to let go.'

"John Boyd, of San Francisco (who married Mr. Seth Cook's sister and to whom these properties helonged), told me that the Boston & Montana people, through Mr. Couch, spent over thirty days sampling and making working tests hefore purchase. Mr. Couch is regarded out West as a very capable miner, and it does not seem possihle that he could have erred in his purchase. Does 'C. E.' know that at $3 per ton the Merced properties can pay handsome dividends and, I believe, pay good interest on the present value of the stock? Is 'C. E.' aware of the fact that the Tyro mine, which lies directly south of one of the Merced mines (the Malvina No. 2) milled over 3 feet of ore for many months, which averaged over $23 to the ton, and that they worked up to the Malvina line? There was rock at the collar of the shaft on Malvina No. 2 last year which gave me fine results in panning.

"In making the following statement I court contradiction and discussion: I coutend that nowhere to-day in the gold-hearing zones of the known mineral world does there exist a better field for iuvestment than upon the mother lode of California, not even excepting Africa. For some unkuown reason California has heen spoken of as a gold producer of the past, and the impression has prevailed that she is declining in her gold production. Such is not the fact, and I venture to say that within two years California will again reach the $20,000,000 mark for her annual gold output.

"Regarding the present market value of the Merced stock, it is absurd for 'C. E.' to hold the Bigelows respousible. They listed the Merced mines at a fair valuation: the gambling public have seen fit in trading upou the market to raise the value of the stock. I would rather buy Merced to-day, at present prices, than any South African stock offerod."

Nevada.

ONE MONTH'S RUN.—*Telegraph:* 208 ounces of gold nuggets is the result of one mouth run from the Bald Mountain Extension gravel miue.

MINING GROUND SECURED.—*Transcript:* A patent has heeu secured hy J. D. Hague for certain mining ground lying between Gold Hill and Scadden Flat, known as the Watt and Judd ground. With the Scadden Flat property, lately secured, it completes an extensive chain of claims hetween Gold Hill and Allison Ranch. The late patents include conveyances from C. E. Clinch, the es'ate of Wm. Watt, and the heirs of Ben McCauley. The claims were located in 1854 hy Melville Atwood, the well-known mining engineer and mineralogist, aud hy other parties, and in early days were exceedingly rich.

THE MANZANITA MINE. — The Manzanita mine, near Sweetland, has started up. Twenty men were put to work last Monday. The company got a permit to hydraulic. Charles Miller of French Corral is superintendent.

A NEW MILL.—*Union:* H. Jauch of Washington, who owus a mine a few miles ahove that place, will soon begin the erection of a new five-stamp mill on his mine.

Placer.

ON AMERICAN BAR.—A ten-stamp mill will be put up on T. C. McCall's quartz mine on American Bar, near Michigan Bluff. Captain G. A. Nihell will superintend the construction. The quartz will be carried to the mill over a tramway 1,800 feet long. The ledge is from 50 to 100 feet in width, the ore low grade.

Plumas.

MADE FIFTY LOCATIONS.—*National-Bulletin:* C. C. Smith, Supt. of the Golden Ancient Channel Consolidated Mining Co., during the summer has been conducting work on his company's property situated on a branch of Bear Creek, which empties into the Middle Fork of Feather river at a point southwest of Quincy. He and his associates, residents of Santa Clara county, made fifty locations, covering 1,000 acres and ahout six miles of the supposcd channel. They have been sinking a prospect shaft, which is now dowu 83 feet. After passing through a lava cap of 47 feet, a stratum of pipe clay was encountered. The shaft is expected to enter gravel soon. Pumping machiuery will be put in to handle the water and sink faster.

Shasta.

CHROME ORE.—The Dunsmuir *News* says that a miner inspecting the chrome mines on Little creek has found a mountain of ore there. Some of the property is owned hy the Hearst estate and some by J. Champion.

MOUNTAIN MINING CO.'S OPERATIONS.—Two miles of the eleven miles of grading for the narrow gauge railroad from the mine to Keswick are finished. The estimated cost of the road is $110,000. There is a three and one-half per ceut grade. A $5000 steel furnace will be put in place as a starter. To every 100 tons of ore will be added 20 tons of silicious ores. The calculation is that each 100 tons will turn out 10 tons of copper matte, carrying ahout 45 per cent. of copper, which will he shipped to the refinery. It is stated that all the coke used will be of English importation. The present payroll is $20,000 monthly.

Siskiyou.

GENERAL MINING NOTES.—*Union:* Espey, Hunter & Co. are running their hydraulic mine at Hawkinsville with full force, the pumps raising water to the flume from Shasta river.

Austin & Co., of the blue gravel mine at Greenhorn, are making exteusive preparations in readiness for commencing work again on a large scale as soon as the winter rains commence.

The American Bar Co., working in the hed of Klamath river, near Ash creek, continues to find rich prospects and considerahle gold in the old chauuel.

The shaft at the Steamhoat mine, McAdams creek, is down 80 feet, with 40 feet more to hed rock. When the hed rock is reached and prospected, to prove rich, a drain will he built down the creek towards Fort Jones, commencing about 40 feet ahove hedrock, as there will he no difficulty in keeping the water out hy pumping to 40 feet distance. The creek runs a great quantity of water, which comes up from bedrock to within 6 feet of the surface in winter, and 12 feet in summer.

Sierra.

THE ALASKA MINE.—A settlement of the Alaska mine's affairs has heen made, subject to the approval of all creditors, hy which the Alaska and Grizzly mines are sold at ahout $28,000, upon sixty days time. Out of this sum the two mortgages upon the property are to be paid off, and $10,000 applied toward the satisfaction of the other indehteduess upon the property. This latter sum will pay the lahor claims in full, less attorney's fees and costs, and will pay ahout 50 cents ou the dollar to creditors for demands other than for lahor. Five hundred dollars have been paid to hind the hargain, and $500 more are to he paid when all demands and claims are assigned to F. D. Soward, and the balauce of $9000 in the sixty days. The *Messenger* understands most of the creditors have already agreed to this plan of settlement, and it is thought that all the creditors will agree to it in a short timo. It is reported that an Englisb company will take the mine and begin operations as soon as the title is cleared.

Tuolumne.

THE STAR MINE. — The Star mine, three miles northeast of the Italian Bar bridge, on the South Fork of the Stanislaus river, now shows a vein three to five feet in thickness, opened by tunnel and drift. It is heavily sulphuretted, containing copper, zinc, lead and iron. The value of the sulphurets is from $500 to $700 and over per ton. A ten-stamp mill is beiug built at the Union Iron Works, to he in active operation on the mine in sixty days. Wilhur Long is superintendent.

NEVADA.

THE COMSTOCK MINES.—Dan De Quille in S. L. *Tribune:* At the Brunswick lode a line of water pipe is heing laid to the new workings from the Combination shaft, and preparations being made for the erectiou of hoisting works, the machinery for which is being constructed. Nothing will be known of the value of the Brunswick vein at the points where work is heing done until crosscuts are run, as the inclines are heing put down outside of the quartz in the foot-wall.

The average of 398 tons on Consolidated California & Virginia ores worked at the Morgan mill, Carson river, during the past past week was $27.53 a ton. The company have shipped to San Francisco $11,203.50, and have ou hand in their assay office $14,000. They are at present doing a considerahle amount of prospecting and development work. A new two-compartment upraise is heing made on the 100 level, and a new exploration drift will soon he started north on the 1000-foot level where much virgin ground remains to be examined. Ore assaying from $2 to $8 a ton is now heing found in a prospecting drift on the tunnel level of the old Ophir works. The Hale & Norcross, Chollar and Potosi are extracting ahout the usual quantity and quality of ore; the Hale & Norcross ore assays $65.52 a ton. The Crown Point people have 500 tons of ore in their ore-bins, and are engaged in exploration work pending a milling stage of water inthe Carson river. Owing to the lack of water iu that stream, most of the Gold Hill mining companies are now engaged in prospecting and making repairs. In several mines down there and in this city promising streaks of ore are heing followed. From these streaks a considerable amount of good ore is being saved at some points.

The mines of Silver Star, Esmeralda county, are improving.

The Silver Peak mill, near the southern extremity of Esmeralda county, has made its first cleanup. It amounted to $13,000.

Eastern parties are honding mines in Union district, Nye county, and work is heing started up on gold properties near Ione.

At Osceola those placer miners have taken out over $1500 in less than three months.

At the placer mines in Sadorus district, Elko county, miners are making good wages. Four men who have a gang of twenty-one Chinamen at work for them, clear $4 a day on each, aud the Chinese get $2 each, hesides what they steal. Three men in another claim take out $12 a day. Men working there with dry-washers are making good wages. It is said that "a peculiarity of these placers is that the richest grouud is found on the mountain side, instead of in the hottom of the canyon as usual." Here is a hint for some quartz prospector.

At El Dorado canyon, on the Colorado, a company has bought twenty mines and will work them in good shape. This is a camp of many hig low-grade gold veins. In the early days 700 claims were located in the district. These mines are six miles from the Colorado river. A big electric plant will he erected on the river, which will furnish power on the ground for hoth mining and milling.

The El Dorado canyon mines are in Lincoln county, in the extreme southwestern part of this State. Near King's river, thirty miles east of Nevada and Arizona, a new mining district is heing opened that promises well. The veins are large and rich in free gold. There are also in the district hig veins of copper carhonates that run high in gold. These mines are seventy miles from Winnemucca, which is the nearest railroad point.

The bodies of two prospectors, supposed to have perished of thirst, were recently found on the road leading to Death Valley.

AT DE LAMAR.—The De Lamar Gold Mining Company of Nevada are doubling the capacity of their mill, hy adding more rolls and pulverizers. This will make the capacity of the mill 120 tons per day; the addition to the mill will he completed by the time the new pipe line is laid from Meadow Valley Wash, a distance of twenty miles. The Swifter mine, which adjoins the April Fool, was sold last week.

OGDENSBURG AND ST. LAWRENCE. — The Ogdensburg and St. Lawrence is the name of a mine that C. G. Fiske and sons have been working at for years, says the *Herald*, hut not until recently have they got it opened so as to work it profitahly. The gold is all coarse, and it is not an uncommon thing to find nuggets ranging in value from $5 to $20. Some of the richest ground in the county has been in the neighborhood of the Fish mine, at the head of Fall ereek, and it looks as though tbe Ogdensburg and St. Lawrence would prove to he as good as the former claims.

HAS NOT SUSPENDED OPERATIONS.—Virginia City *Chronicle*: The Sutro tunnel has suspended operations. It closed down last night and the shift of five men were laid off. The cause of the suspension is said to be a lack of ready money to pay expenses with. The company has heen unable to pay the wages of the men for a couple of mouths. Funds will probahly soon he forthcoming to resume operations on. (The *Enterprise* authoritatively denies this and says work is going right on.)

OREGON.

JOSEPHINE COUNTY.

Courier: Before the fall rains set in there will he nearly one hundred hydraulic mines in Josephine county ready for the giant. This is an immeuse number, hut it is nevertheless a fact. There are employed at these mines from two to thirty-five men for each mine. Perhaps five hundred men mako their livelihood hy working directly in the mines.

WASHINGTON.

Nelson Bennett and M. B. Stacy have ceased operations on the mines recently purchased hy them in the Fish Lake country. The avorage of two cars of oro sent to the smelter was only $14 per ton.

BRITISH COLUMBIA.

THE WAR EAGLE.—*Miner:* The War Eagle mine has put out and shipped 7015 tons of ore to date. The last 27 shipments, amounting altogether to 2300 tons, brought an average return from the smelter of $48.30 per tou. From this must be deducted $10.50 for freight and treatment, $2 per ton haulage to Trail, and $4 for mining, leaving a net profit of $31.30 per ton. A new tunnel is now being run in from helow to tap the vein, which it is expected to reach in 1800 feet. Two new boilers, of 100 horse-power each, are under order and are exnected to arrive shortly. They will he used for driving from 10 to 12 drills. The driving power will he located in one place and will be availahle hy means of compressed air to operate drills in any part of the mine.

GENERAL NOTES.—Mining in the old Cariboo country of British Columhia has heen very active during the summer. Expensive machinery has heen taken in and prospecting has heen carried on to a greater extent than ever before. The preparations for an active season in 1896 are heing perfected. These mines are fully 300 miles north of Ashcroft on the Canadian Pacific railway, and all supplies, machinery, etc., are hauled or packed in. The properties in this remote district are largely owned by Vancouver and Victoria capitalists.

It is reported that the smelting plant which has heen at Golden for a numher of years, hut never operated, is to he dismantled and removed to Midway. A syndicate represented hy S. S. Fowler, M. E., of Chicago, and W. T. Thompson of Fairview, have the matter in hand, and will erect a fifty-ton smelter.

The rumors recently that the Slocan Star had heen sold to a Canadian Pacific syndicate are denied hy Byron White. "It has never heen offered for sale," he said, "nor would it be sold at the price reported, $1,400,000."

A. B. Henryx of the Pilot Bay smelter says that in future his establishment will divide its patronage hetween all the roads. As a result of this decision the steamer Nelson last week moved eighty tons of hullion for shipment via the Spokane & Northern and the Great Northern to Aurora. Heretofore the Canadian Pacific road has had a monopoly of the entire carrying trade of the smelter.

LARGE CAPITAL SUBSCRIBED. — A Victoria dispatch of the 1st says: F. S. Barnard, M. P., who has just returned from England, was successful while there in forming a syndicate comprising banking houses of London, Paris, Berlin, Amsterdam, Glasgow and Manchester, to develop the gold fields of British Columhia. The capital of the syndicate is £300,000, of which £232,500 is availahle for immediate use. Barnard is to be managing director, and has gone to Kootenay.

THREE CLAIMS BONDED.—P. Aspenwall has given Mason and McKinney, of the Trail Mining Company, a thirty days option on his interest in tbe Kootenay, Copper Jack and

Tip Top claims for $40,000. The Rossland *Miner* says the taking of the option means a sale, the thirty days time being given in order that Mason, Hoge and McKinney may obtain the ratification of the board of directors of their company in Illinois. Mason is president of the Trail Mining Company, which owns and has been working the Columbia mine. Hoge is one of the directors and McKinney the treasurer of the company. Messrs. Mason and Hoge are members of the firm of Mason, Hoge & Co., who now have under construction six miles of the Chicago drainage canal at the price of nearly $1,000,000 per mile.

IDAHO.

THE YELLOW JACKET.—The forty stamp mill on the Yellow Jacket mine will soon be increased to a sixty stamp. A good wagon road has just been completed from Salmon City. The amount of ore the company can work by open cuts is estimated at one million tons. One vein averages $80 a ton, and another, twenty to twenty-five feet wide, runs from $6 to $7. Two or three other companies are operating in the vicinity of the Yellow Jacket, and there is talk of having lixivintion mills erected, and additional stamps put in their mills. When the Yellow Jacket mill is increased to sixty stamps it will crush at least 200 tons per day. Much of the ore is in a half pulverized condition. The company's receipts at present are from $25,000 to $30,000 a month.

MONTANA.

THE SNOWSHOE GROUP.—The company owning the Snowshoe group of mines near Libby is building a concentrator with a capacity of 100 tons per day.

UTAH.

THE ONTARIO TUNNEL AND ELECTRIC PLANT. The Ontario mine, formerly so wet, is no longer famed in that regard, the new tunnel successfully draining it, the flow of water being utilized by an electric plant. It has taken six years to build the tunnel, at an expense of $466,753, a distance of 15,494 feet. The annual saving over pumping is $164,000. An electric plant, with power supplied by the stream of water, lights the mine and runs the mills and lights Park City. There is a steady flow of water of 800 cubic feet per minute and an available fall close to the tunnel mouth of 125 feet in 380 feet. There is an overland route six and a half miles in length. The hydraulic plant is located 1600 feet from the mouth of the drain tunnel; water is brought through a flume and ditch to the pressure-tank, from whence it is piped to a three-foot Pelton wheel. The dynamo furnishes 2500 volts, with a full-load current of twenty-five amperes. Seven hundred 16-candlo power lamps are supplied at 110 volts. Three motors are used, one of twenty-five-horse power and two of fifteen-horse power, and everything works satisfactorily.

MERCUR PROPERTIES LEASED.—*Tribune:* G. Dorsey of Nebraska, J. Dern, manager of the Mercur, E. H. Airis and J. Heimrich, respectively secretary and treasurer, have a working lease and bond on a group of ten claims belonging to the owners of the Sunsbine and adjoining the incorporated properties of that company on the south. The terms were $100,000, the deeds to be placed in escrow, a cash payment of $5000 and a contract to do $100 worth of assessment work on each of the ten claims between now and the 1st of January, 1896.

SOUTH DAKOTA.

THE MOFFATT PROCESS.—*Pioneer:* The Moffatt oxidizing process will be in operation at Pluma by the first of November, as the company is putting in machinery in the old Taylor cyanide building. Articles of incorporation have been filed at Pierre, with a captal of $500,000. Many of the miners who operate on a small scale are holding their ore at present, intending to give the new process a trial.

COLORADO.

A TEN DAY'S RUN.—A ten day's run on Cripple Creek low grade ores enabled the Metallic Extraction Works, at Florence, to ship to the United States mint at Denver a $20,000 gold ingot. The works are treating about 125 tons daily.

TO MINE IN PITKIN COUNTY.—The Silver Diadem Mining Company has been incorporated, to mine in Pitkin county, with offices in Aspen and an authorized capital stock of $100,000. T. G. Lyster, Orin S. More and R. G. Withers are the incorporators.

ARIZONA.

THE TUCSON SMELTER.—The Tucson smelter blew in Sunday night and Monday was working a full force. Three eight-hour shifts are being run and about twenty-five men employed. There is sufficient ore on the dump for a twenty day's run. All conper ores will be brought and cash paid for them. There were forty applicants for work that could not be supplied.

TO RESUME.—*Miner:* J. W. Gerritt has at last settled the affairs of the Oro Plata and Ninety-Three mining companies satisfactorily to the creditors, and the two properties will resume operations Monday. The mines are among the richest in Arizona and will be made to produce heavily during the next two or three months.

MEXICO.

SONORA.—At Lampazos, the Cleveland & Montezuma Mining Co. turn out about $30,000 worth of silver bullion monthly, which goes to the mint at Hermosillo for coinage. They have a mill which reduces about forty-eight tons of ore every twenty-four hours.

SOUTH AFRICA.

APPRECIATION OF MINING SHARES.—The aggregate appreciation of South African mining shares in the last twelve months is almost beyond comprehension. The importance of the advance may be seen from the fact that the companies working the Witwatersrand district alone, having a nominal capital of £16,000,000, are now quoted in the market at prices which give an aggregate market value of £86,000,000. The appreciation in the market value of the shares of those companies alone between the end of March and the beginning of September was £60,000,000, nearly $300,000,000. All that, however, represents but a small part of this wonderful inflation that has gone on in twelve months. Mr. Cecil Rhodes' Chartered Company of British South Africa had a market value a year ago of £4,000,000 for the entire stock. It now has a valuation of over £18,000,000, an increase of $70,000,000. The shares of the De Beers Diamond Company now have an aggregate market value of £12,000,000, as compared with a little over £94,000,000 a year ago. Here is an appreciation of value in a year of $410,000,000. A remarkable feature of the market is the fact that the great advances in quotations are almost wholly found in those securities which pay no dividends. An old speculator once said that he liked the shares of the Erie road because there was no blinked nonsense of dividends about them. This seems to be the situation with the mass of speculators in the European mining markets. When once a company becomes a regular dividend payer it settles into quietness. Indefinite prospects seem much more attractive to the speculators than cash returns.

Coast Industrial Notes.

—About 16,000 feet of steel pipe is to be furnished and laid and a dam and reservoir built for a water system at Rossland, B. C. B. C. Rihlet is the constructing engineer.

—Secretary of the Navy Herbert will award the contract for building one of the new torpedo boats to Moran Brothers, of Seattle, Wash., at their bid of $160,000.

—San Franciscans who have secured control of 10,000 acres of land near Hanford will raise sugar beets. Claus Spreckels has agreed to build three sugar refineries in the San Joaquin valley and take all the sugar beets raised in the vicinity.

—The Mariposa *Miner* says that the proposed new railroad to the Yosemite from a point in Merced county will be constructed; that a corps of nineteen engineers is now in the field, and that Coulterville will be connected with the main line by a branch.

—Seventy-five men are building an 18,000 ft. flume to carry the waters of the South Yuba to the power house of the Nevada County Electricnl Power Co. The flume and dam will be finished by November 1st, when the company will install its plant, two 500 H. P. generators being put in at the outset. Messrs. Hasson, Hunt and Eckart of this city have charge of the electric part of the work.

—The Chino beet sugar factory, which began operations July 9, has turned out for the season nearly 28,000,000 pounds of fine sugar. This is the biggest concern of the kind in the United States. The outfit represents an investment of nearly $1,200,000. For labor and supplies over $500,000 is paid out every season. The average beet crop is twenty tons to the acre, for which the factory pays $4 per ton. About 25,000 gallons of petroleum are daily consumed in the boilers, which is piped from Puente, fourteen miles distant.

—The Southern California Mountain Water Company has incorporated at San Diego; capital stock $3,500,000. It succeeds the Mount Tecarte Company in constructing the irrigating system of that company, including four dams, calculated to irrigate most of San Diego county south of the San Diego river and west of the main range. The lower Otay dam is already half completed, and a big blast of nitro-glycerine is to be exploded on the 6th to dislodge 150,000 tons of rock. The company has expended $100,000 this year, mostly in preparatory work.

—The Great Northern Railway Co. has let a contract for 1000 box cars, a step taken in expectation of a heavy increase of tonnage upon that line. They are to be built by the Haskell & Baker Car Co. of Michigan City, Ind. Under the contract, exclusive of Washington fir and cedar, some 6,000,000 feet will be required. The average cost of a box car is $500. The lumber that goes into it is worth less than $50. Ninety per cent. of the cost is represented in iron, labor and profits. The order of the Great Northern road is worth to this coast about $40,000. If the cars were made here it would be worth nearly $500,000.

—A survey is being made for a narrow gauge railroad from the copper mines near Grant's Pass, Or., to Chetco, a distance of forty miles. From Chetco it will join the Hobbs, Wall & Co.'s railroad to Crescent City. The main object is to get an outlet for the copper to be shipped from the copper mines to the Eastern markets and to San Francisco. The copper will be shipped from Crescent City to its destination by steamer. The Siskiyou mines at Wheeler City and the Elmer-Brown mines at Waldo are to be joined together by a narrow gauge railroad. Captain Wheeler has bought here the machinery to put the mines at Waldo in shape for operations.

—The jetty at the mouth of the Columbia, between Oregon and Washington, is nearing completion. Major Post, United States engineer, who has charge of that work, states that October 15 the shipping of rock to the jetty will be discontinued, and the work closed down, and he does not expect that it will be resumed again. During the past season 206,000 tons of rock have been put on the jetty, and about 216,000 tons since October 15, 1894. The jetty is one of the most successful works of the kind ever constructed, and the cost has been far within the estimates. It was begun 10 years ago, when there were only from 18 to 20 feet of water on the bar at the mouth of the river, and even that could not be relied on, as the sand was constantly shifting. The jetty is 4½ miles long. The estimated cost was $3,700,000, and the actual cost will be $1,900,000. The amount of stone used in building the jetty will amount to about 940,000 tons, and so well has the work been arranged and managed that this rock has been placed on the jetty at an average cost of $2.30 per ton. This includes the first cost of the rock, cost of towing plant, superintendence and everything.

—The government jetty at the mouth of San Diego harbor is now built out into the ocean a distance of 3350 feet. A wing wall of 300 feet is being built toward the ship channel. Up to the completion of the work for this year the work has required 46,500 tons of rock and 7770 cubic yards of brush. When the jetty is fully completed, according to the present plans it will be 7200 feet long, requiring 110,000 tons of rock and 9000 cubic yards of brush. The cost will be about $250,000. This jetty concentrates the tide in one channel across the outer bar, thus deepening the entrance to the harbor. A similar work at the mouth of the Columbia river has been very successful, the depth of water in the channel there being now thirty feet.

—Till recently it was supposed that the efforts of some San Francisco men to get control of a portion of the Los Angeles oil-yield for direct local consumption would result satisfactorily. Over $500,000 was ready for investment. The idea was to pipe it at a cost of eight cents a barrel, pay fifty cents for railroad transportation, and with a cost of ten cents a barrel for handling here, have it aggregate sixty-nine cents in San Francisco. It sells here now for $1.25, and three barrels are accounted equivalent to one ton of coal. The ultimate intent was to build a pipe line from Los Angeles to Santa Monica or San Pedro, put on two tank steamers, and bring it here by water. But it is understood that the Los Angeles people have made such conclusions and arrangements with the Standard Oil Co. that that concern has secured control of about six acres of the oil district. It is thought that over three thousand barrels daily could have been disposed of in this city, with a great corresponding saving in the fuel bill, but since the deal with the Standard Oil people the San Francisco projectors of the scheme have ceased to take any present active interest in the matter, so far as the Los Angeles district is concerned. Meanwhile there are other oil fields, and the local demand exists.

Personal.

GEO. MAINHART has assumed the superintendency of the North Banner mine.

W. C. RALSTON has returned from an extended sojourn on the Atlantic slope.

JOHN W. MACKAY and Jas. L. Flood are investigating some mining properties in El Dorado Co.

C. OSBORN, for twelve years superintendent of the Virginia Gas Works, has gone to Santa Cruz to take charge of the Santa Cruz Light and Power Co.'s business.

LESLIE SIMSON, till recently assayer at the Selby Smelting Works, has accepted a position with the Simner & Jack Mining Co., Johannesburg, South Africa.

GEORGE H. THOMAS has resigned his position as manager of the Princess mine, on Magalia ridge, Butte Co. C. H. Schiveley of Oroville has assumed the duties of that position.

Delegates, Attention!

There will be found on another page of the PRESS a general invitation to delegates to the Miners' Conventiou and all mining men, issued by the National Base Ore Reduction Company, to visit its works, near Shell Mound, Oakland, and investigate its new and cheap process for handling all refractory ores. Mr. A. J. Robinson, the general manager, will be pleased to see those who are interested, at the company's principal office, room 170, Crocker building.

Obituary.

IRA P. RANKIN died of pneumonia in this city last Tuesday. He was a native of Massachusetts and was 77 years old. He came here forty years ago, and in '58 started an iron foundry with Mr. A. P. Brayton, now at the head of the Pelton Water Wheel Co., as partner. The foundry was afterward known as the Pacific Iron Works till sold to the Union Iron Works. Mr. Rankin was one of the pioneers in that business on this coast and occupied an honorable place in business and philanthropic circles.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING SEPTEMBER 24, 1895.

546,649.—SASH FASTENER—Ann E. Bray, Los Gatos, Cal.

546,730.—AWNING—T. J. Daniels, San Francisco.

546,854.—WINDOW OPENER—Holdbrook & Beals, Couperville, Wash.

546,960.—PRESERVING TIMBER—F. A. Lobert, National City, Cal.

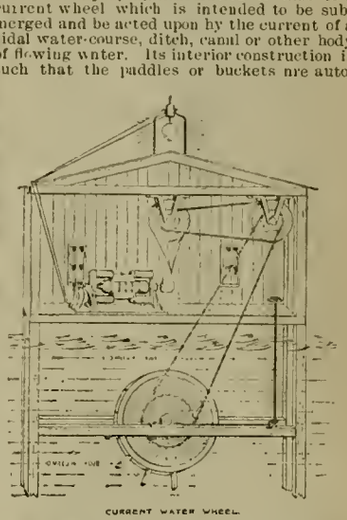
546,904.—TELEPHONE SYSTEM—Salisbury & Dean, Tacoma, Wash.

546,749.—AMALGAMATOR—G. M. Urie, San Francisco.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

An Improved Current Water Wheel.

The accompanying illustration is that of a current wheel which is intended to be submerged and be acted upon by the current of a tidal water-course, ditch, canal or other body of flowing water. Its interior construction is such that the paddles or buckets are automatically projected when at the lower part of the circle, slots being cut through the periphery through which they pass on and out as the wheel revolves. In this way the power of the current acts only on the lower portion of the wheel. The principle of this wheel was invented by Mr. Stephen Di Vecchio of San Francisco, and the wheel, as now made, has been improved for the uses it is adapted for by some of the members of the American Power and Tide Wheel Co., which company is now the owner of the patent rights for the original invention and all improvements thereon.



CURRENT WATER WHEEL.

THE AMERICAN POWER AND TIDE WHEEL CO
(CAPITAL STOCK $900 000 90,000 SHARES AT $10 EACH

Where and how this wheel can be put to use will suggest itself to many who are interested in localities favored with water-courses, either natural or artificial, and who could make use of power generated by this means if for no other use than pumping water. In many places along the coast and on the bays where the tidal currents may be utilized, such a wheel is very valuable. The marsh lands which so extensively border the bay of San Francisco, and the rivers flowing into it, are everywhere cut by dee sloughs or creeks through which the tide ebbs and flows with a swift current. A wheel of this kind placed in a fixed position under the surface of the water so as to be submerged at all times will work with the current of both the ebb and flood tides without any attention whatever.

Even in the main bay itself, where the currents are always swift, the wheel could be utilized. It has been found by experiment that when the surface current of an ebb tide at the Golden Gate is running about five miles per hour, at a depth of 200 feet the current is about ten miles an hour. The subsurface currents are always swifter than those at the surface, though that alone to the bottom is slower than at the surface. The current at two-thirds of the total depth is generally the swiftest.

The illustration shows the wheel at work in such a place as the "Golden Gate," where it could be placed at such a distance below the surface of the water as to get the full benefit of the lower surface currents, which, as stated, are the swiftest and most powerful. Connected with pumps, it could then be made to raise water and deliver it into suitable reservoirs provided for the purpose, from which the water could be piped into the city for fire, sanitary or power purposes, or else used upon turbines and the power converted into electrical energy and the water run back into the ocean.

Placed in irrigation ditches or small running streams in the mountains, with wing dams running from the banks, it can be made to fully utilize the difference of level above and below the dam and raise water to irrigate high land very cheaply.

Its adaptation as a paddle wheel of a steamer is believed to be practical, and would be the means of saving power now wasted. As the wheel can be made with only two or three paddles projecting at one time, the raising of the water behind the wheel would be obviated by its use.

It could also be utilized in streams where mining is carried on with wing dams and Chinese pumps. It would not be necessary to raise and lower this wheel at different stages of the water. In the sloughs in the marshes it could be made to pump water to an elevated tank for power purposes or to store up electricity, as its work would be constant on both the ebb and flow of the tide. It would only be for the half hour or so at the stand of the tide when it would be inoperative.

The mechanism for operating the buckets, and throwing them into position at the proper point, and again withdrawing them, is very simple, but ingenious. There is nothing to get out of order or require special attention. A model of the wheel may be seen at the office of the American Power and Tide Wheel Company, Room 15, No. 405 Montgomery St., in this city, which will be pleased to furnish any further information concerning this wheel and the many uses to which it may be adapted. *

Scientific Progress.

Chemical Food Experiments.

The "scientific food" idea has had a check. It has been weighed in the balauce of experience and found wanting. A detachmeut of the United States army was recently detailed to try it. Fifty men were sent out for a three days' march with "scientific rations" iu their haversacks. They had little tablets of highly coucentrated esseuces of coffee and bread, which, it was imagined, would be as serviceable as the bulkier drink and food in their usual form. But at the end of the first day three-quarters of them were doubled up with cramps. Their digestive organs could not assimilate the concentrated food, or were not satisfied with it, and the experiment was a failure. It is stated that the men were ordered to keep on to the end of the three days' trial, which seems a needless hardship. Their stomachs and iutestines are uot likely to take to a diet of chemical tablets any more kindly on the second or third day than on the first.

There is something attractive in the uotion of scientific food. In many respects it would be a great gain if men could live on a few pills or powders or tablets, instead of bulky masses of bread and meat. But it is impossible. A million or so years hence it may be effected, when man has become physically as different from what he is to-day as he is to-day from the oyster, but not before. The man of to-day not merely requires a certain amouut of absolute nutriment, but he requires it to be commiugled with a certain bulk of other matter which is not nutrimeut at all. He has not only organs of assimilation, but equally elaborate and important organs of excretion, which demand to be supplied with material for their work.

Man cannot exist upon a chemical diet, for the plain reasou that he is a man. He has physical requirements and functions which demand food in other form thau chemical extracts. Much may, of course, be done by science to improve our food supply, to render it more wholesome, more efficient, perhaps more couvenient and portable. Beyoud such limits it can scarcely go. Still the new idea has adherents.

Dr. George Plumb, one of the chemists of the University of Chicago, says that the time is soon coming when hot water and food tablets will be the sole accoutrements of a kitchen. He says the essential food elements of a 1200-pound steer can be got into an ordinary pillbox. One of his tablets the size of a pea makes a large bowl of soup. A ration case of his planning, which weighed eight ounces, contained the following supply: Three tablets coucentrated soups, equal to three quarts; four tablets beef, equal to six pounds; one tablet milk, equal to one pint; two tablets wheaten grits, equal to two pounds; one tablet egg food, equal to twelve eggs.

Stars and Molecules.

In astronomy we have to do with the greatest things in nature. The sun is 90,000,000 miles distant from the earth, and of a bulk one and oue-third milliou times as great. The plauet Neptune is thirty times as far away as the sun. The nearest to us, so far as we know, of all the stars (Centauri) is well-nigh 10,000 times as distant as the planet Neptune, while beyoud it are hundreds of millions of stars farther and yet farther off. Some that can be just detected are probably 10,000 times as remote as Centauri, or, in other words, 3,000,000,000 times as far away as the earth is from the sun.

But the light that comes across those distances and reveals those far-away orbs reaches us through movements and vibrations due to molecules far smaller than any microscope can reveal. That light shakes the minute molecules of a photographic plate placed in the focus of a telescope, and leaves behiud the record of its knocks. It vibrates in the bright lines of solar and stellar spectra. In a no less wonderful way molecular knocks—most minute, but most numerous—trausmit and maintain the heat of the sun and of the stars. But, it may be asked, What are molecules and atoms? Can we affirm their existence? Can we measure their size or detect their action? Can we count them, or determiue the uumber and energy of their knocks if they are so minute?

An atom literally means that which cannot be cut. According to the atomic theory of the constitution of matter, all bodies are supposed to be made up of atoms. An atom, therefore, represents the smallest possible quantity of auy elementary body, a quantity incapable of subdivision, if, indeed, such a conception of iudivisibility is possible.

A molecule literally means a little mass, and is considered to be an aggregation of a certain number of atoms; in general, of atoms of different elements, but in some cases, it may be, of atoms of a like kind. Molecules are held to form the ultimate constituent particles of a compound body. The molecules of such a body cannot be divided if it is to retain its nature as a compound. They will, however, be resolved into coustitueut atoms, if the compound body be resolved, by some process or other, into its constituent elements. So long, for instance, as water is water, its molecules each consist of two atoms of hydrogeu joined to one of oxygen. But, if a volume of water be resolved, by heat or electricity, into two separate volumes of oxygen aud hydrogen, each molecule of the water is thereby resolved into its constituent atoms. All the atoms of oxygen go together to make up the total volume of oxygen, and all those of hydrogen to form the total volume of hydrogen, obtained from the given volume of water. So also in other similar cases.

Solid Oxygen.

Professor Dewar, the chemist, has compressed oxygen under an intense degree of cold, a degree almost beyond the power of imagination, into a pale blue fluid, a thing which, although it has been done to such an extent or in such quantity, has solidified oxygen into a jelly, has made ozone into a lapislazuli-blue fluid, and has also liquefied air. He has made the suggestion that possibly the vast shining night clouds, concerning whose composition, whether of congregated stars at immeasureable distance or of nebulous matter slowly coucentrating into stars, astronomers have arrived at no fixed conclusion, may really be only masses of carbonic acid gas frozen in the unspeakable cold of the interstellar spaces which is probably the zero of absolute temperature.

Sir Audley Coote arrived in this city last week from Sydney, N. S. W. He has had considerable to do with cable projects in the South Pacific. Regarding the recent laying of a cable from Australia to New Caledonia he discovered some hitherto unheard-of submarine peaks, hard limestone and grauite rising abrubtly from the bottom of the ocean to a height of over 7000 feet, there being less than 300 fathoms of water ou the highest peaks. This submarine range is seventy-five miles in length and occasioned the use of forty-eight miles more cable than had been calculated on, as it had to be laid around the base of these peaks in the same fashion that a railroad would be built through a mountainous country. This cable was successfully laid from Queensland to New Caledonia, a distance of 1000 miles. Sir Audley will attend the International Cable Congress in Switzerland in '96, to take part in the discussion of the proposed cable line from Monterey, in this State, to Hawaii, a distauce of 2400 miles. It is the ultimate intention to extend this Pacific cable from Hawaii to Fauning's Island, thence to Samoa, the Fiji Islands and New Caledonia, thus completing a chain of 6500 miles of submarine communication and girdling the earth.

Mechanical Progress.

One Way of Distributing Niagara's Power.

Now that the great Niagara power plant is, in part, completed and about to realize what, for years, has been the dream of engineering economists, it is interestiug to recall one of several of the pet schemes advanced in earlier days as means of utilizing the power of the falls. The modest proposition was made by an inventor who had cropped up somewhere to have a large tube laid from Chicago to New York City via Niagara Falls, and then, by turning the Niagara river into a monster turbine, compress air to about 250 pounds pressure per square inch in this tube. The latter was to be tapped at the cities along its line, and power furnished as required. As an improvement on this scheme, some mechanical genius at the time suggested that the air-compressing machinery be dispensed with as too complicated, and that the turbine be geared direct to a shaft which should be laid through the State of New York from west to east. From this shaft, power could be delivered by means of belts or gears directly to the machinery in the factories along the line of the shaft. The suggestion carried more weight of metal with it than any ever made in connection with a mechanical construction, but the idea was not more absurd than thousands to be found iu the history of the world's mechauical progress.—Cassier's Magazine.

Pipe Coverings.

A short time ago G. M. Brill, of the Solvay Process Company, Syracuse, New York, undertook a series of experiments in order to ascertain what was the best pipe covering available for use in his works. He purchased from various manufacturers samples of eleven differeut kinds of material, enough of each kiud being taken to protect sixty feet of pipe. With each sample in turn he covered a piece of pipe sixty feet in length, and subjected it to a thorough scrutiny, observing particularly the amount of condensation effected iu each case. The follow table shows the pounds of steam condensed per hour per square foot of pipe, and the cost of sixty feet of covering applied to the pipe:

Nature of Covering.	*Steam Condensed Per Foot Per Hour. Pound.*	*Cost of 60 Feet of Covering.*
Bare pipe	0.8458	.....
Magnesia	0.1200	$33.87
Rock wool	0.0802	29.62
Mineral wool	0.0890	23.34
Fire felt	0.1570	31.80
Manville sectional	0.1093	32.56
Manville sectional and hair felt	0.0662	40.56
Manville wool cement	0.1078	42.56
Champion mineral wool	0.0990	18.87
Hair felt	0.1309	13.50
Riley cement	0.2979	28.71
Fossil meal	0.2747	34.20

—American Manufacturer.

An ingenious Australian has invented and introduced a mica cartridge for sporting and military guns. The filling inside the cartridge is visible, and a further advantage is that instead of the usual wad of felt a mica wad is used. This substance, being a nonconductor, unaffected by acids or fumes, acts as a lubricant. Where smokeless powders, such as cordite aud other nitro-glycerine compounds, are used, mica has a distinct advantage over every other material used in cartridge manufacture. Being transparent, any chemical change iu the explosive can be at once detected. The peculiar property it has of withstanding intense heat is here utilized, the breech and barrel being kept constantly cool. The fouling of the rifle is also avoided, the wad cleaning the barrel.

In putting together quartered pine, or any other kind of wood, greater strength and durability can be obtained by placing the grain of the wood at an angle of 60 degrees than can be obtained by crossing at 90 degrees. As all wood expands and contracts more or less under the variations of moisture in the atmosphere, the pieces glued at an angle of 60 degrees can expand and contract to a certain extent without tearing themselves apart, as in the case when glued at an angle of 90 degrees. The 60 degrees glue joint simply pulls the joint out of place a little, and disturbs its shape, while the 90 degrees glue joint pulls things to pieces in its effort to accommodate itself to climatic conditious.

M. Blondel of France has devised a successful method of welding lead. The surfaces to be welded are carefully cleaned, and then a layer of lead amalgam, composed of lead and quicksilver, is placed between. An ordinary soldering iron is then passed over the edges, the mercury is vaporized, and the finely divided lead fuses and unites the surfaces in a perfect weld.

Electrical Progress.

Reverberatory Electric Furnaces.

By H. Moisson.

The reverberatory electric furnace with movable electrodes which we built in 1892, and successfully improved since that time, is of great simplicity. By means of this apparatus we have been able, thanks to a sufficieutly high temperature, to reproduce diamonds, to effect crystallization of the metallic oxides, the reduction of oxides heretofore deemed irreducible, the fusion of refractory metals, the distillation of lime, silicon, zirconium aud of carbon, and finally the abundant evaporization of metals, such as platinum, copper, gold, iron, manganese, aluminum and uranium. The operation of our apparatus is of the most simple character. The current is carried by two flexible cables to the carbon electrodes. The contact is established, the arc starts, and, by withdrawing the electrodes more or less, this powerful spark is given a constant length which depends on the power of the current, and on the conductivity of the metallic vapors which fill the furnace.

From the beginning of the experiment a penetrating odor of hydrocyanic acid is produced, brought about by the combination of the nitrogen in the furnace, with the acetylene which is formed at the beginning. This is an energetic reproduction of the beautiful synthesis of hydrocyanic acid obtained by M. Berthelot. A purple cyanogen flame first illuminates the arc; then this color disappears aud the color becomes white. The lime which forms the interior of the furnace soon begins to melt and to run like wax, and then to boil, and in a few minutes the electrodes are brought to a red heat, a torrent of vapor issuing from all sides with a constantly increasing intensity. The lime distills in abundance and covers the supports of the electrodes with a white film. Thus, when utilizing the current of a machine of from 100 to 300 H. P., we have in the middle of the furnace an enormous temperature, produced by the electric arc; a few centimeters below, the crucible which encloses the matter experimented on; and below this, a wall of lime in full ebullition. The bad conductivity of this lime is a fortunate thing for us. It confines in the smallest possible cavity the maximum heat which an electric arc can give us.

This new apparatus, which we have modified according to the requirements of experience, has permitted us to undertake the study of a whole series of simple bodies which heretofore were only laboratory curiosities, for the lack of sufficient means to obtain them. Among the substances is chromium, which has never heretofore been obtained in any large quantities. In order to obtain chrome steel it was necessary to prepare in a cupola an alloy of iron and chrome very rich in carbon, and known as ferro chrome. With an electric furnace an abundance of cast chrome is obtained by reducing sesquioxide by means of carbon. This cast product, when refined, gives us the chromium, and this inoxidizable metal is very different from that heretofore obtained. It takes a finish like iron, and a very beautiful polish. In

one experiment forty-four pounds of chromium were obtained at one casting. Molybdenum can also be obtained in the same way in large quantities. Combined with steel it takes a temper and can be forged under the anvil at red heat.

Tungsten was a substance formerly known to chemists only in a state of powder; its preparation in the electric furnace will become very simple. Under the action of the arc the oxide of tungsten will be reduced by the carbon and will give us in a few minutes a pure metallic mass, covered with a beautiful layer of blue oxide of tungsten. The tungsten does not seem to have a great affinity for carbon, and can therefore be produced in a very pure state.

By submitting a mixture of sesquioxide of uranium and carbon to the electric heat reduction is made in a few minutes and produces a metal having a brilliant fracture and an extreme hardness, and with a slight admixture of carbon presents the curious property of igniting on contact with silica. All these simple metallic bodies melt at the very highest temperatures; beside them we placed other metals, whose minerals are very rare, such as zirconium and vanadium.

During these long researches we have had occasion to handle currents of greatly varying strengths. Beginning with small machines of 4 H. P. they have been gradually increased up to machines of 100 to 300 H. P., situated in the station of the Edison Co. These studies have led us to the conclusion that the heating power of the electric arc certainly increases with the intensity of the current. M. Rosetti looked upon the electric arc as possessing a constant temperature, independent of the current, and he attributed to this arc the excessive temperature of 4800°, and at the positive electrode with the current furnished by 120 Bunsen elements a temperature of about 4000°, although physicists have not yet measured this in a reliable manner. With the enormous heat giveu out by the arc we are very certain that we are very far from the 2000° which we obtained formerly in the laboratory.

By means of a machine of 300 H. P. titanium has also been prepared in large quantities, the properties of which are entirely different from those formerly attributed to the gray powder bearing that name. This body takes fire in fluorine, it does not decompose water except at red heat, and possesses the curious property of burning in nitrogen at high temperature, furnishing the nitrate of titanium. It combines easily with carbon and silicon, but not with argon.

I am convinced that the working of metals by means of the heat of the electric arc will be developed to a very high degree. One will thus avoid adding to the mineral all the impurities of the coal, the gangues and the fluxes will disappear, and finally one will bring to the desired temperature the mixture to be put iuto reaction. As an example we may mention the production of carbide of calcium, which by contact with water disengages acetylene, for the production of which works are being erected in America, England and Germany.

Earth Currents and the Earth Dynamo.

By JAMES S. LANG.

With the advent of modern electrical transmission, there has come to inventors and scientists iu general a partial realization at least of the tremendous waste of energy continually going on around us. Those more sanguine and less practical would harness the tides which roll against our coasts and compel the moon herself as she swings along in her path, a corpse among worlds, to drive our factories and light our streets.

And yet such visions are not wholly illusions, but are capable of being developed to a certain degree, by careful study of the conditions, with proper discrimination between the practical and the impractical.

One class of phenomena worthy of more attention than it has received is that relating to earth currents. This is not to be wondered at, as investigation flows in well-defined streams, and the attention of investigators has been turned to subjects of more immediate pecuniary value.

The theory of their cause which I present here, and which is a result of the action of what I designate as the earth dynamo, appears to be borne out by the facts and phenomena observed.

It has been known for many years that there was an intimate connection between the sun spots, the magnetic needle and earth currents. This connection is so well marked, and its action is so certain, that it would indicate conclusively that magnetic polarity is possessed to an intense degree by the sun. That the magnetic poles of the sun coincide very nearly with its geographical poles is shown by the fact that, in the absence of spots, no changes in the terrestrial magnetic state occur which have a periodicity equal to the time of solar rotation. The suu, then, we are forced to conclude, may be considered as a magnet, in the same way that we look upon the earth as one, and as such possesses its liues of force, which, after having passed from pole to pole inside the sun, envelop and pass the earth at a distance of 91,000,000 miles on their return course. Far beyond our farthest planet these lines spread out in gigantic ellipses, bringing planet and asteroid alike into magnetic touch with the seething monitor of our solar system. And our planetary system is again and again permeated with weaker lines of force having their origin in other suns than ours, and our sun himself, as he whirls ceaselessly onward, feels with his magnetic uerves the influence of the sideral system of which he is a single atom. The milky way stretching across our sky points to our minds the direction of the lines of force which have hurled together suns, stars and systems. Multiply the range of our telescopes by infiuity and you would see other gelastic belts, around, beyond and parallel to our owu, stretching away into endless space—indices of lines of force—the handiwork of an infinite Creator, the harmony of whose productions exceeds our wildest flights of imagination.

Thus we see that one factor of the magnetism of the earth is due to the lines of force passing through the sun, which penetrate the earth on account of superior permeability.

That the magnetic poles of the earth are not stationary is shown by the constant diurnal variation of the magnetic needle. Their virtual traces on the earth's surface revolve in small circles around the traces of the main pole, and the angle between the two tangents to these circles drawu to a magnetic needle gives the amplitude of diurnal variation of that needle under normal circumstances.

It is plain that if a wire be suitably placed on the surface of the earth, it cuts this revolving component of the earth's magnetism and we have earth currents as a result. We may consider the earth as a typical spherical armature, familiar to all, in the conductors of which, at times when the equatorial component grows large, we have high voltages.

We see, then, that earth currents may be due to the revolution of this earth armature in a magnetic field of which the sun is the immediate inducer. We are, then, led farther: Why not wrap our earth with a suitable system of conductors and wrest from our Mother Earth an amount of power equal to that wasting at every tide on every sea?

It is easy to determine its feasibility, for we know that the iutensity of the revolving equatorial component is equal to the side of half the angle of the diurnal variation of the compass times the intensity of the earth's magnetism. A difference of potential of oue volt being produced in every conductor which cuts 100,000,000 lines of force per second, if we surround the earth with a coil of 100 wires, it may easily be shown that a difference of potential of upwards of 60,000 volts would be produced under normal conditions.

For wires extending both above and below the equator with turns connected in series, the following methods of application will apply: Selecting such a position on the earth's surface that data applicable to that place will be approximately a mean for the whole surface, we may say that the actual intensity of the earth's magnetism is equal to the horizontal component times the secant of the augle of inclination of the dipping needle.

Taking horizontal component equal to .20 of a line per square centimeter and inclination equal to 60°, we have for the intensity of the earth's magnetism .40 of a line per square centimeter.

The revolving equatorial compouent of this will be equal to .40 times sine 7 feet, when diurnal variation is 14 feet, which equals .0008144 of a line per square centimeter. The area swept over by a single wire placed as designated will be $2\times48,875,360,000$ square feet, or $2\times44,940,709,440,000$ square centimeters.

Therefore the voltage induced will be

$$\frac{44\ 940,709,440,000\times2\times.0008144}{100,000,000}$$

which equals 742. This multiplied by 100, the number of turus of wire used, equals 74,200 volts.

If the difference of potential was 60,000 volts in round numbers, and No. 0000 wire used, one-eleventh of an ampere would flow, and the total power produced would be 5454 watts, or less than 8 H. P. Although the amount would rise into hundreds of H. P. at those times when earth curreuts become abnormal, the enormous cost of the plant would forbid its practical application.

PROF. GEORGE FORBES, who has brought the Niagara electric plant to a successful completion, says: "The directors have no present desire to send the current to great distances. It will pay better to create a smokeless manufacturing town in the neighborhood."

Practical Information.

Red Lead for Iron Work.

Red lead has density, weight, body. To get the heavy pigment thoroughly incorporated with the lighter raw liuseed oil put in considerable red lead and comparatively little oil. By so doing the particles of red lead will not settle out of the vehicle either in the pot or on the surface, greater covering will be had than in a thin mixture, rapid drying will ensue, the use of japans will be obviated, and the maximum durability obtained. That chemical union of red lead with linseed oil which gives red lead paint its superiority is most completely effected when raw oil only is employed. Should, however, a thinner mixture be wanted, to sustain more completely the heavy particles of red lead, the introduction of a small quantity of japan, say one-half pint to a gallon of paint made with raw linseed oil, or the substitution of boiled oil for the raw oil is desirable to prevent running. The latter practice is that of a number of railroads, probably with a view to economy in the use of red lead. The saving in pigment, however, would most likely be more than offset in the settling of the red lead from the oil if much less than twenty pounds are employed to the gallon of paint, even with the use of japan. Where raw oil only is employed a few pounds more of red lead may be necessary, dependent on the atmosphere and temperature. Where weighing the oil is impracticable, through lack of time or facilities, we would recommend a given weight of red lead to each gallon of oil as being more convenient. Thus the specificatious of the Cincinnati Southern Railroad, on which red lead has been used with eminently satisfactory results, reads: "Not less than 37½ pounds of pure red lead to each gallon of pure boiled linseed oil."

The superintendent of a large bridge company which uses red lead as a standard says their formula is 30 pounds of red lead to a gallou of raw linseed oil. Good results will no doubt be had anywhere between the figures given, in some cases with 25 pounds of red lead to the gallon of raw linseed oil, or occasionally even a few pounds less. There can be no absolute, unvaryiug formula for mixing. Temperature, moisture, experience and skill of the painter are all factors.

The use of lamp black introduces a new element into the mixing of red lead paint. Lamp black requiring considerable more oil than red lead, more oil should be used aud less red lead can be used in a mixture of red lead, lamp black and liuseed oil than in one of red lead and linseed oil alone. As the lamp black also retards the natural drying properties of red lead, a small quantity of japan might be recommended not so much to cause drying as a binder for materials of such diverse specific gravity.—Scientific Machinist.

A MAN may measure the width of a river or of any other stream by means of the brim of his hat, provided the ground on his side of the stream extends back level for some distance. The man stands facing the river and pulls down his hat brim until the edge of it is on an exact line with the edge of the bank on the opposite side of the stream. Then, putting his hand under his chin to steady it, so as to keep his head in the same position, he turns slowly around and notes where the edge of his hat brim cuts the ground on his own side of the river. The measure of the distance on the level ground will be the width of the river.

THE human frame is a magnet. A man will carry a watch for years and be proud of its accuracy. Then he will fall ill, the watch will lie on the mantelpiece or on the chest of drawers and will develop great inaccuracy and unreliability. The only explanation given is that the absence of magnetism upsets the time announcer, and the best proof of this is that when the man recovers and takes his watch it soon gets right again. No two men appear to have the same magnetism in their frames, and it is seldom that two can use the same watch satisfactorily.

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About 5000 square feet of surface on top of the monitor of the roof of the new forge shop of the Berliu Iron Bridge Compauy at East Berlin, Conn., consists of an impervious material called translucent fabric, which transmits the light quite well, although giving it a decided yellow tinge. The material consists of a wire cloth, having a mesh of about an eighth of an inch, covered with a product of linseed oil which resembles a flexible gelatine, and is made by a secret process. The roof at East Berlin has sustained three severe rainstorms without leaking, cracking or changing its shape. The material is said to remain unignited when exposed to a temperature of 800° Fahrenheit, and it has been in use without injury on a foundry skylight inclined at an angle of 45°, within tweuty feet of a chimuey blowing out sparks and small pieces of molten metal. The fabric weighs from a seventh to a tenth as much as ordinary skylight glass, and is claimed to be particularly suited for skylights of factories and shops, particularly those having iron roofs. It was not very long ago that it was aunounced that glass plates containing wire were being made for covering large passenger train sheds and for other places where it was necessary to secure plenty of light and at the same time be sure that there was no chance of accidents from broken glass. The translucent fabric appears to differ from the wire glass in being much stronger, a poorer conductor of heat and by no means transparent.

Professor Runnebaum, of Berlin, sent by the German government to examine the timber resources of our Pacific coast, expresses amazement at the waste he witnessed here. He says the end of American forests is near at hand unless they are protected by law against reckless cutting and conflagrations. While the leading countries of Europe are trying to make trees grow, the Americans are sweeping away not only the mature trees but the saplings, which are the rightful heritage of future generations. "If nothing is done by your Government," in his opinion, "you may live to see lumber shipped from Germany to Puget sound." When the professor was in Oregou and Washington the whole coast was darkened with smoke from fires devouring enormous tracts of timber unsurpassed iu the world. His remark that the life of the forests is the life of the people is no flourish of rhetoric. It is a verified law of nature, but trifled with or ignored as yet in America.—New Orleans Picayune.

One of the immense guns for the Uuited States battleship Oregon has arrived at the Union Works on a special car constructed for the purpose by the Pennsylvania Railroad. The car is similar in construction to the one used for transporting the Krupp gun to Chicago during the World's Fair. The car will be returned immediately for the purpose of transporting the other three guns of the same size. The gun is a thirteen-inch rifled piece, weighs 157,500 pounds and is 40 feet in length. The car is so constructed as to distribute this weight as evenly as possible over the numerous wheels of the trucks. It is expected that all the guns will be in place upon the Oregon before wiuter.

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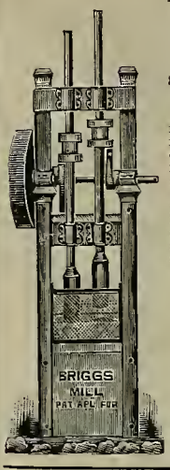
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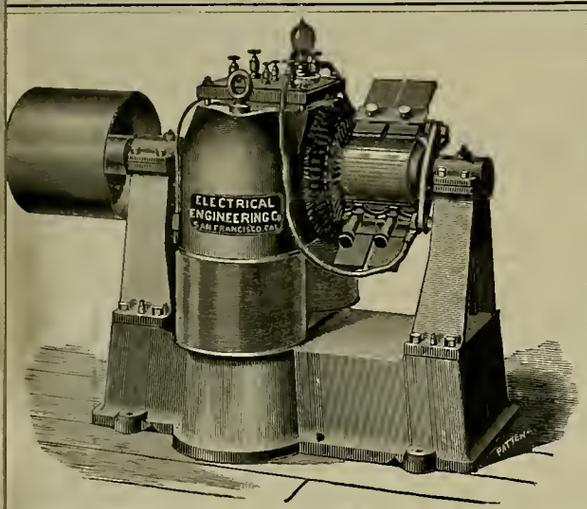
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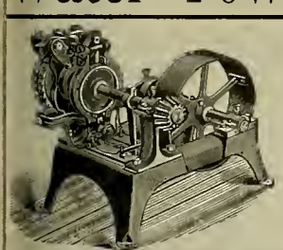
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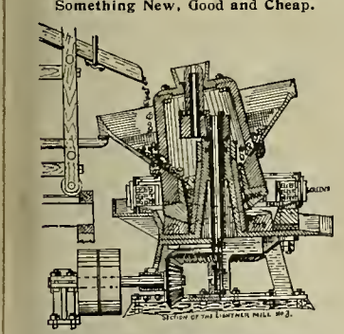


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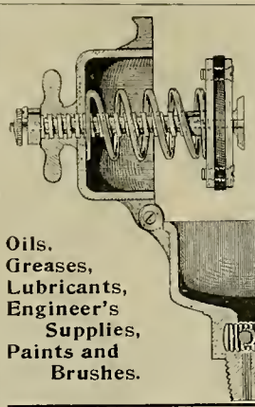
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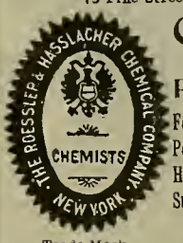
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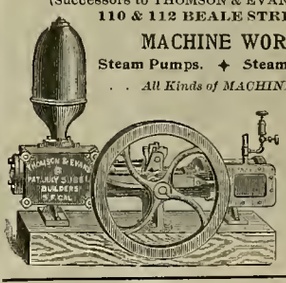


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Steam Pumps. ✦ Steam Engines.
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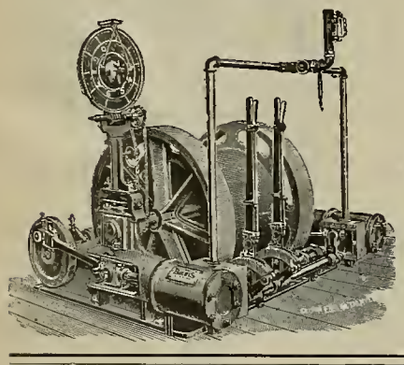
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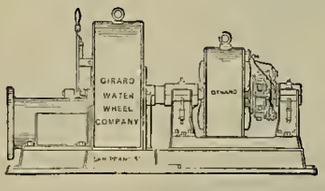
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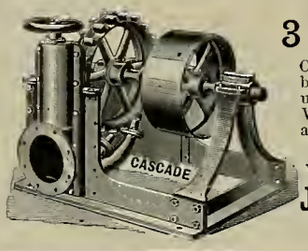


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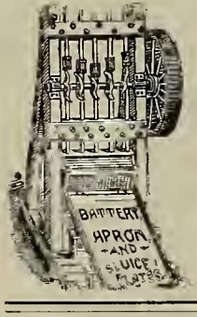
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FOR THE CONVENIENCE OF OUR READERS IN THE MINING COUNTIES WE PRINT IN legal size, 12x38 inches, the Mine Bell Signals and Rules provided for in the Voorhies Act, passed by the State Legislature and approved March 8, 1893. The law is entitled "An Act to Establish a Uniform System of Mine Bell Signals to Be Used in All Mines Operated in the State of California, for the Protection of Miners." We furnish these Signals and Rules, printed on cloth so as to withstand dampness, for 50 cents a copy. MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

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PUMPS--Cornish and Other, Copper and Lead Furnaces, All Classes of Marine Work.

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NEW YORK OFFICE: 145 BROADWAY. CABLE ADDRESS: "UNION."

The Edward P. Allis Company, Milwaukee, Wis.

Established 1860. Reliance Works.

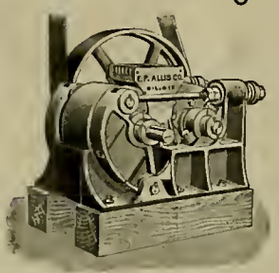
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Denver, Col.	427 Seventeenth Street.
Minneapolis, Minn.	416 Corn Exchange.
Chicago, Ill.	509 Home Ins. Building.
Kansas City, Mo.	43 Armour Building.
Pittsburgh, Pa.	German National Bank Building.
New York City	26 Cortlandt Street.
City of Mexico	Calle Gante, No. 12.

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IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.

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Cams, Tappets, Bosses, Roll Shells and Crusher Plates.



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These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

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Special attention given to the purchase of Mine and Mill Supplies.



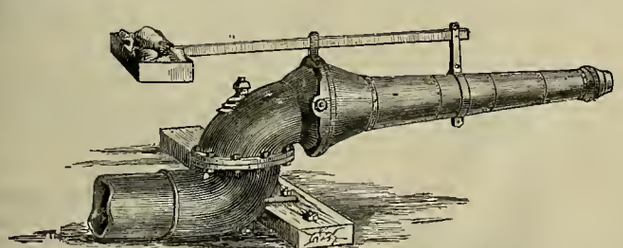
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The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 42 Fremont St., San Francisco.

A REVOLUTION IN ORE PULVERIZING.

THE

Merralls Hydraulic Quartz Mill,

The Greatest Ore and Rock Pulverizer in the World, Either Wet or Dry.

THE ONLY MILL BUILT THAT RIVALS STAMPS. Our six-foot mill (No. 1) will reduce more ore or rock to pulp than a ten-stamp mill, with less than one-half the power and less than one-half the wear and tear, besides saving a much larger per cent of the gold in the ore.

This mill will reduce from 25 to 500 per cent more ore than any other rotary mill in use. Cheap, simple and economical. Four sizes built—from 15 to 250 tons capacity.

Send for Circular. Address

MERRALLS MILL COMPANY,

Room 12 Third Floor, Mills Building..... San Francisco, Cal.

Market Reports.

The Markets.

SAN FRANCISCO, Oct. 3, 1895.

The advance in copper is not a "boom," but a case of supply and demand. It now looks as if both demand and supply would be something tremendous. So far in '95 the total output of the copper mines of the United States has been 25,000,000 pounds less than home consumption and exports. During the year ending June 30, '95, copper exports were 60,000,000 pounds less than for the preceding twelve months. Every copper prospect on the continent is getting attention, and the output for '95-'96 will be enormous. Yet that copper will advance beyond 12½ seems certain.

Silver has lifted itself from 59½ six months ago to 67, around which point it oscillates. That it is able to regain and retain even that figure is satisfactory.

The *Iron Age* says the situation "in the steel market is puzzling. It has been difficult to understand where all the product turned out goes to in the absence of a good railroad demand, and yet the larger interests are scrambling for the raw material. It can only be explained by assuming that important developments in steel rails are pending."

New York Metal Market.

NEW YORK, Oct. 3.—PIG IRON—Southern, 12@14.50; Northern, 12@13.25.

COPPER — Brokers', 12.00 @ 12.15c; exchange, 12.20@12.25c.

LEAD—Brokers', $3.15; exchange, $3.37½.

TIN—Straits, 14.40@14.55c.

SPELTER—Domestic, $4.25.

New York Silver Prices.

NEW YORK, Oct. 3.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30½	66⅞	12 20	.....
Saturday	30⅝	66⅞	12 25	3 20
Monday	30½	66¾	.....	3 25
Tuesday	30⅝	67	.....	.....
Wednesday	30⅝	67	12 20	3 35
Thursday	30¾	67	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prims, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.88½
London Merchants	$4.87½
London Sight Bankers	$4.89½
Refined Silver, per ounce	67c
Mexican Dollars, nominal	54¾c

San Francisco Metal Market.

COPPER.			
Bolt	¼ & 5-16, 20c; ⅜ and larger, 20c		
Lake Superior Sheathing	22	@	—
Ingot, jobbing	—	@	18
Ingot, wholesale	17	@	18
Sheet copper	—	@	21
ZINC.			
Sheet	9½@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " "			1 45
Buck, Balls and Chilled, do, " "			1 45
IRON.			
American Soft	16 00	@	18 00
Pig, per ton	18 00	@	20 00
STEEL.			
English, lb	16	@	19
ANTIMONY.			
Per lb	—	@	10½
PIG TIN.			
Per lb	15	@	16 00
QUICKSILVER.			
Home trade, per flask	41 00	@	— —
TIN PLATE.			
Per bx	5 25	@	6 00
ZINC.			
Sheet	8½@		
BORAX.			
Refined, in car lots	—	@	5½
Refined, in sacks and barrels	—	@	5¾
Powdered, in car lots	—	@	5¾
Concentrated, "	—	@	4¾
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 50
Greta			7 50
Nanaimo			7 00
Gilman			6 50
Seattle			7 00
Coos Bay			5 50
Cannel			8 50
Egg, hard			13 00
Wallsend			7 50
Scotch Splint			8 00
Brymbo			8 0
TO ARRIVE—CARGO LOTS.			
Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —
COKE.			
Gas Companies'	75c ₱ bbl		
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —
NAILS.			
Wire			$2 50
Cut			2 25
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from E. C. Hard, in the Terry Hill Mine, near Spanish Ranch, Plumas Co., to impound tailings in an old pit; from Will De Viney, in the Lone Star Placer Mine, Cromberg, Plumas Co., to impound tailings in Jackson Creek; from Charles Jordan, in the Poor Man's Hydraulic Mine, near Placerville, El Dorado Co., to impound tailings in Taylor's Ravine; and from L. Canato and G. Oneto, in the Eagle Mining Claim, on Dry Creek, Amador Co., to impound tailings below the mine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Oct. 14, 1895, at 1:30 P. M.

Mining Share Market.

SAN FRANCISCO, October 3, 1895.

The general markets shaded off on Friday and Saturday of last week, opening weak on Monday, but recovered somewhat on slight advance in Potosi and Cbollar. The improvement was short lived, for under a strong selling of the Gold Hill shares there was a rapid decline along the entire line. The setback was precipitated by the levying of an assessment and reports circulated of others to follow, supplemented by an impression tbat the deal was over. Tbe weakening caused brokers to call for more margin, whicb brought about a large selling on Wednesday morning. This selling sent prices down from tbe highest figures touched on the preceding day about 20 per cent in the Gold Hill shares and from 10 to 15 per cent in the middle and north end shares. Owing to the recovery which set in after the sharp decline not having been rapid, the prevailing opinion is still bearish. Notwithstanding the somber looks of the market we still adhere to the opinion expressed in last week's issue that the market will do considerably better before long, yet this opinion does not warrant outsiders who cannot pay cash, overbuying. It is always a safe proposition to be prepared for the unexpected when dealing in mining shares. So far as outside indications go, there is nothing to warrant the belief that there is a money syndicate in tbe market, and until this is shown it would seem the part of wisdom to take the bird in hand and let some one else try and get the two birds in tbe bush. The activity shown by Potosi and Chollar would indicate that the small pools said to be manipulating tbe market have concluded to take them in for manipulating with those given in our last issue. If this view is correct, then the three groups will show more life on the next upward move. The shares in the Alta group were weak and inactive. Botb Alpha and Occidental broke badly under a 10-cent assessment. In the Bodies prices weakened off with Bodie selling freely under 30 cents a share. A report is current that Con. Virginia is to be assessed, but it is hardly likely that this will be done before some time in next month; but it is reported that otber assessments are to be levied sooner.

From the Comstock mines the news is of the most favorable character. This news is reported in official letters, yet it is not of so pronounced a character as that wbicb comes to hand tbrough private channels. In the Alta group tbe work done bears close watching, still it may be sometime before results can be known. In the Gold Hill group work bas been suspended in Belcher and Seg. Belcher. Overman is milling 200 tons of ore, assaying about $50 to the ton. Crown Point is still working to the west. The Kentuck winze improves as it goes down. Before ten days pass Confidence's west drift from the surface tunnel ought to strike the downward continuation of the ore found eighty feet above. Yellow Jacket continues to push some important work. Con. Imperial is still running the drift for tbe west lode, but slow progress is being made. Tbe same remarks apply to Alpha. In the middle group there is an improvement in Potosi, but more work has to be done before its extent and value can be found out. Hale & Norcross will reduce the accumulated ore which ought to net the company over $10,000 in coin, while Savage is still pushing important work and extracting ore. In the north-end group the work in Con. Virginia points to more time, as does that in Gould & Curry and Best & Belcher. An improvement is reported in Ophir, wbich has a favorable bearing on Mexican. The work being done is on both the upper and lower levels. Still better results are looked for soon. In Union and Sierra Nevada the work under way is being closely watched, yet it may take more time than is now expected before results can be known. In Andes tbe work under way is of an exploiting character. West Con. Virginia's contract for tbe use of the Con. Virginia's old shaft having expired, there are some doubts about their getting a renewal. It is stated that in the event of its not being secured, work will be resumed on the upper levels, owing to the west drift run on the 1100-foot level having drained the mine.

From the Bodie district the news is unimportant. The work under way is both dead work and exploiting. Work on the Brunswick lode is being pushed ahead. It is stated that exploiting drifts will be started soon, but what will be found it is hard to say. Still there are many miners who are very sanguine as to the outcome.

The lowest and highest prices paid on regular call from Sept. 26 to Oct. 2, inclusive, were as follows:

	Lowest.	Highest.
Aita	$ 10	....
Alpha	06	$ 15
Andes	39	54
Belcher	46	56
Best & Belcher	1 10	95
Bodie	35	27
Bullion	20	14
Buiwer	06	07
Caledonia	....	....
Challenge	64	71
Chollar	53	60
Con. Virginia	2 45	2 60
Con. Imperial	03	....
Confidence	1 70	2 10
Crown Point	38	47
Exchequer	04	....
Gould & Curry	45	53
Hale & Norcross	1 40	1 50
Justice	08	....
Kentuck	10	13
Mexican	69	77
Mono	....	....
Ophir	1 55	1 75
Overman	13	20
Potosi	63	72
Savage	37	41
Seg. Belcher	08	09
Sierra Nevada	85	94
Union	59	65
Utah	07	10
Yellow Jacket	38	46

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alpha Con, Nev	15	10c	Sept 30, Nov 5, Nov 28	C E Elliott, 79 Nevada Block
Alta S M Co, Nev	50	10c	Sept 16, Oct 21, Nov 11	J E Jacobus, 309 Montgomery
Bodie Con M Co, Cal	18	15c	Aug 13, Sep 16, Oct 7	M E Willis, 309 Montgomery
Gray Eagle M Co, Cal	41	5c	Sept 23, Oct 28, Nov 22	W J Gurnett, 308 Fine
Occidental Con M Co, Nev	20	10c	Oct 1, Nov 14, Nov 25	Alfred K Durbrow, 69 Nevada Block
Seg Belcher, Nev	16	10c	Sept 12, Oct 15, Nov 4	E B Holmes, 309 Montgomery
Savage Mining Co, Nev	87	20c	Sept 20, Oct 23, Nov 12	E B Holmes, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date.
Con Cal & Va M Co, Nev	E W Havens, 58 Nevada Block	Oct 21

Miners, Attention!

OUR works at Shell Mound are now ready to demonstrate to owners of mining properties (in carload lots or less) the quick and cheap reduction of refractory ores, by the "Holland Patent Blow Pipe Furnace." Refractory gold and silver ores are made free milling. The furnace is constructed to save all volatiles, no values allowed to escape. Complete plants in sizes to handle 10 tons per day up, built at reasonable cost, in comparison to all other methods. We would be pleased to have you call or write.

National Base Ore Reduction Co.,

WORKS.....NEAR SHELL MOUND, OAKLAND.

BUSINESS OFFICE.....170 CROCKER BUILDING, SAN FRANCISCO.

The following illustrates the changes of the week:

Mines.	Sept. 26	Oct. 3
Alpha	$ 12	$ 07
Alta Consolidated	....	08
Andes	57	38
Belcher	60	48
Best & Belcher	1 15	95
Bodie	....	....
Bullion	....	....
Challenge	74	68
Choilar	60	53
Confidence	2 15	1 75
Consolidated California and Virginia	2 70	2 50
Consolidated New York	....	....
Crown Point	....	40
Exchequer	....	....
Gould & Curry	56	45
Hale & Norcross	1 45	1 40
Justice	08	....
Mexican	80	69
Ophir	1 80	1 60
Overman	20	12
Potosi	65	64
Savage	40	38
Sierra Nevada	1 00	87
Union	72	56
Utah	....	....
Yellow Jacket	45	40

San Francisco Stock Board Sales.

SAN FRANCISCO, Oct. 3, 1895.

9:30 A. M. SESSION.

100 Alpha Con	07	200 Crown Point	40
1350 Andes	38	500 Gould & Curry	45
100 Belcher	48	100 Hale & Norcross	1 40
100 Best & Belcher	91	100 Mexican	69
100	95	900 Occidental	14
100 Challenge	67	250 Ophir	1 60
900	68	100 Overman	12
200 Choilar	53	200 Savage	38
100 Con Cal & Va	2 45	200 Sierra Nevada	85
150 Confidence	1 75	100	84
500 Con. Imperial	02	200 Union	56

SECOND SESSION—2:30 P. M.

200 Ophir	1 60	100 Alpha	08
500 Mexican	68	200	07
380 Best & Belcher	95	200 Belcher	47
100 C. C. & Va	2 45	250 Sierra Nevada	87
40	2 50	50 Union	56
200 Savags	37	100 Alta	08
200 Andes	38	500 Challenge	66
100 Potosi	64	100	65
100	63	1050 Occidental	15
100 Yellow Jacket	40		

NOTICE OF ASSESSMENT.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the first (1st) day of October, 1895, an assessment (No. 20) of Ten (10c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room No. 69, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fourth (4th) day of November, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on MONDAY, the twenty-fifth (25th) day of November, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURROW, Secretary.

Office—Room No. 69, Nevada block, No. 309 Montgomery street, San Francisco, California.

ANCHOR COAL AND DEVELOPMENT COMPANY.

NOTICE OF ANNUAL MEETING.

The annual meeting of the shareholders of the Anchor Coal and Development Company will be held at the office of the Company, No. 632 Market Street, Room 5, San Francisco, California, on MONDAY, the 21st day of October, 1895, at 11 o'clock A. M., for the purpose of electing a Board of Directors for the ensuing year and the transaction of such other business as may come before the meeting. E. D. FARISH, Secretary.

OFFICE.

The shareholders of the Anchor Coal and Development Company will please take notice that the office of the said Company has been removed from 19 Montgomery Street to 632 Market Street, Room 5, as per resolution of the Board of Directors.

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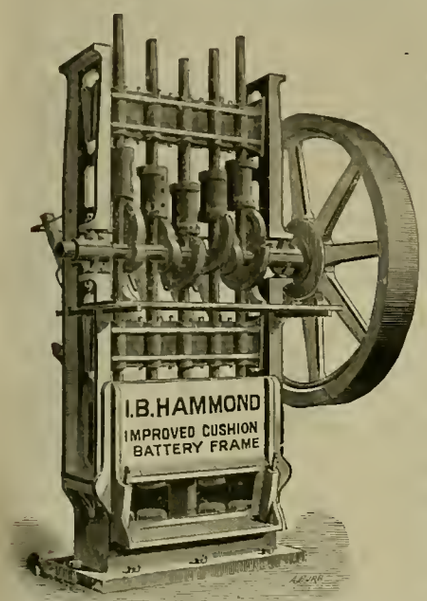
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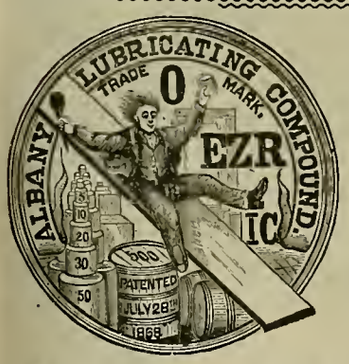
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We refer by permission to Mr. N. A. McMillan, Haines, Oregon, manager of the Blue Mountain Mining Co., at Rock Creek, Or., where ten of our stamp mills are in operation; also to Mr. John S. Miller, Helena, Montana, manager of the Diamond Hill Mining Co., operating one of our forty-stamp mills at their mines at Townsend, Montana.

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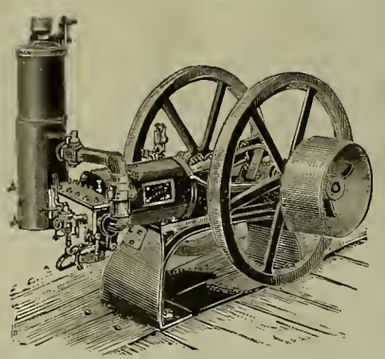
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Coal Gas, ten hours' run, 1900 feet	$2 00
Gasoline (74 deg.), ten hours' run, 8½ gallons @ 14c	1 25
Coal Oil, ten hours' run, 7½ gallons @ 10c	75
Crude Petroleum, asphaltum base, 16 gallons @ 3c	48
Crude Petroleum (36 deg.), paraffine base, 13 gallons @ 5c	65

On the crude petroleum with asphaltum base we had an over-product of 7 gallons of asphaltum; the market price is 3 cents per gallon=21 cents. This deducted from the first cost of the crude petroleum for ten hours' run leaves a net balance of 27 cents. And from the crude oil with a paraffine base we had an over-product of 3 gallons of good lubricating oil, which we consider equal to any we have ever used, but will estimate its value conservatively at 20 cents per gallon, making 60 cents; this deducted from the first cost of the crude oil leaves a balance of 5 cents, total cost of running ten hours.

It will be readily seen that the operation of these Engines with crude petroleum reduces the cost of operation to a minimum. Crude petroleum with paraffine base at 1-10c per horse power per hour; on crude petroleum, asphaltum base, ¼c per horse power per hour; on domestic coal oil, 1½c per horse power per hour; and on gasoline, 2½c per horse power per hour.

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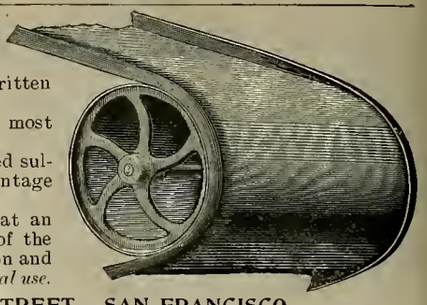
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We have been granted two United States patents for improved devices in concentrating belts, the first and most important of which is for a slight riffling of the surface at intervals and crosswise of the face of the belt.

While these riffles are only about one-thirty-second of an inch in depth, they are very effective in saving floured sulphurets and reclaiming quicksilver and amalgam that may escape from the plates, thus gaining a large percentage of values that would go off with the tailings from belts with entirely smooth surfaces.

Our second patent is for an improvement in the flanges which practical mill men will appreciate. They stand at an acute angle inwardly, therefore they thoroughly confine the pulp on the belt; and in passing over the end pulleys of the machine, lie partly down, consequently do not crack or break, as do the old-style flanges; thereby much vexation and loss is avoided. *We keep in San Francisco and New York belts of all lengths and widths suitable for all concentrators in general use.*

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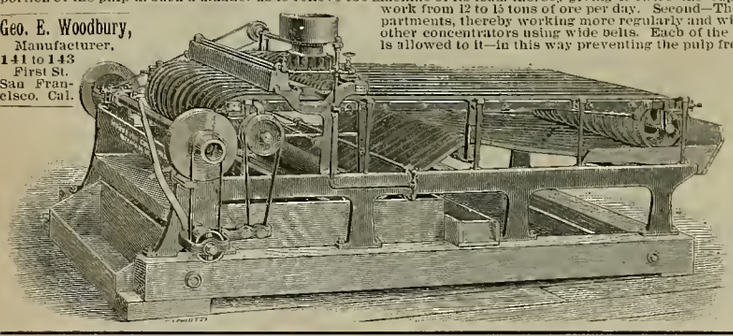
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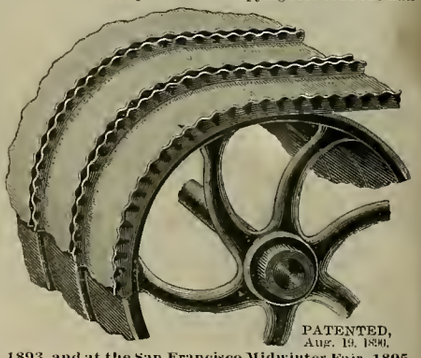
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The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

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PATENTED, Aug. 19, 1890.

This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1895.

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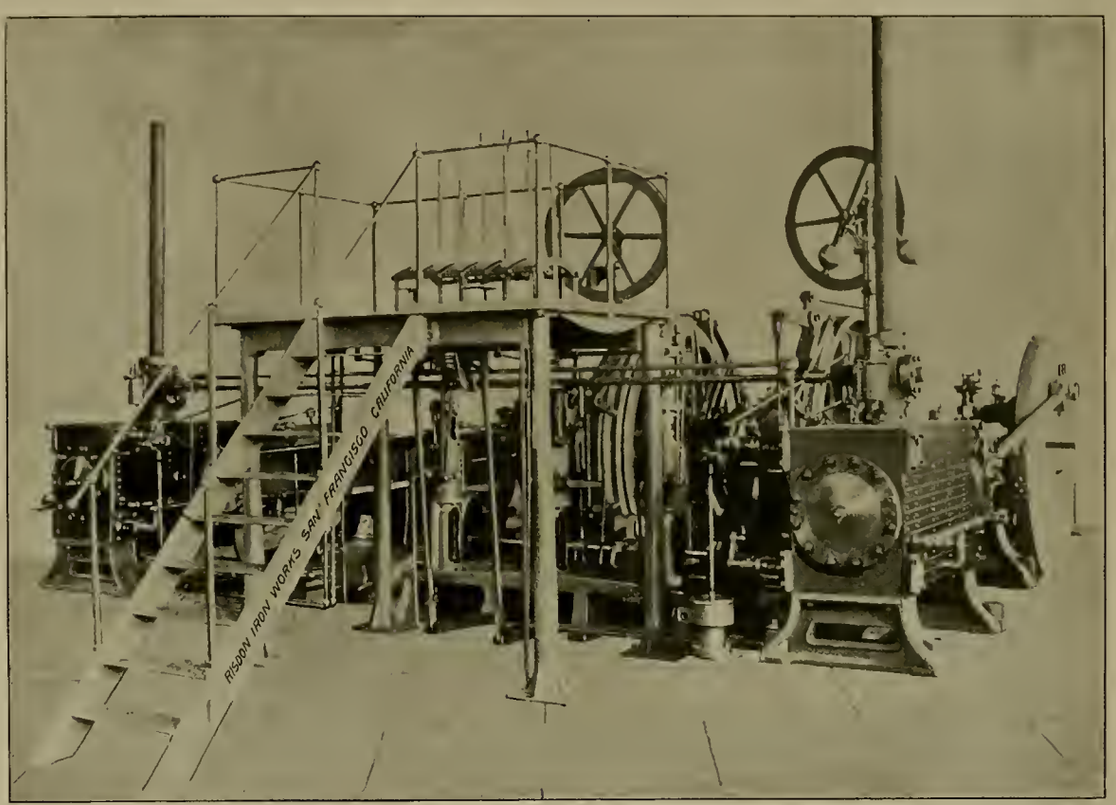
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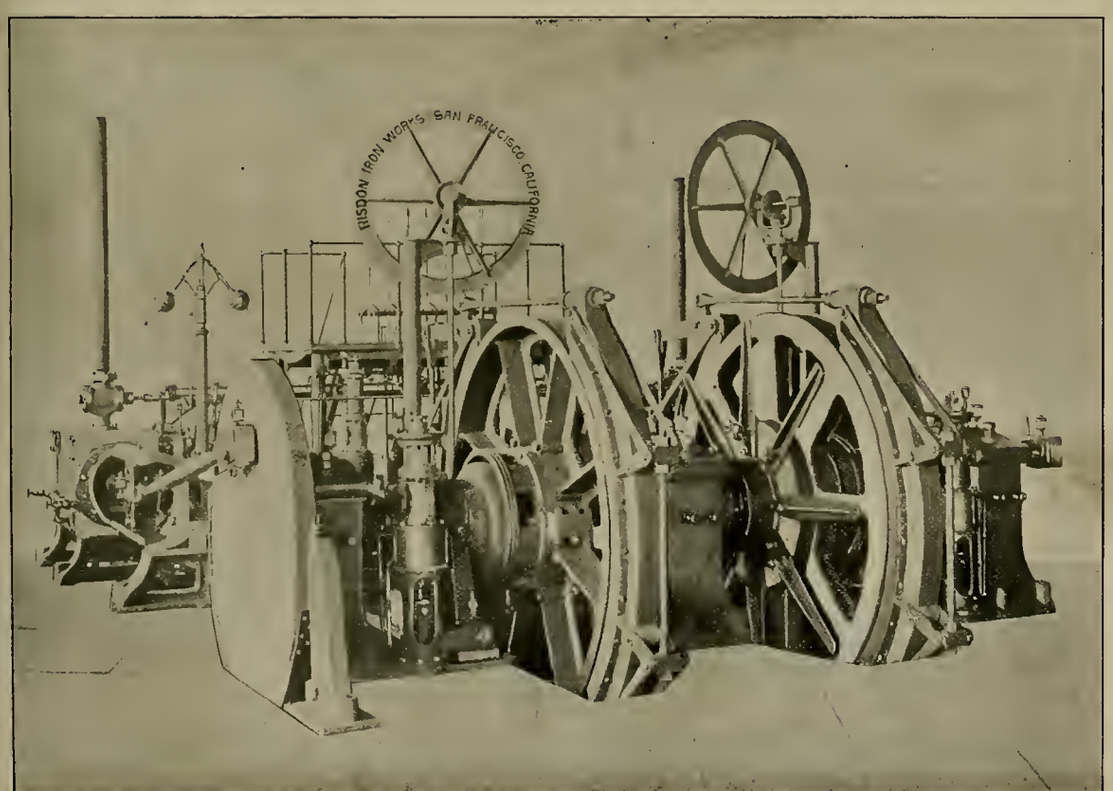
VOLUME LXXI. Number 15. SAN FRANCISCO, SATURDAY, OCTOBER 12, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Merced G. M. Co.'s Hoisting Engine.

Herewith is illustrated the latest design of first motion hoisting engine, as designed by the Risdon Iron Works for the Merced Gold Mining Company, and now being erected on the Nelson shaft at Coulterville, Mariposa county. This hoist is a model of its kind and is claimed to be the most complete yet built in this country. It is designed for a depth of 2000 feet, at an average speed of 1750 feet per minute and a maximum speed of 3000 feet per minute. The engines are equipped with Risdon Corliss valve gear, and are directly connected to the reel shaft. The engine bearings are all adjustable and of massive construction.



The auxiliary engines are five in number—two for the reel brakes, one to operate the reversing gear, and one for each clutch. All are of the Cataract cylinder type, the upper cylinder being filled with oil, and having an adjusting valve to regulate the speed with which they operate, which can be done with a nicety. The engine is handled from an elevated platform, giving the engineer full view of the collar of shaft, also all parts of his engine. The cylinders are equipped with automatic relief valves and hand reliefs, which act as a cylinder brake when lowering with one cage. The reel brakes are of a new design, embodying all the latest improvements. The crank discs are equipped with band brakes operated by foot. The entire construction has received the greatest care and attention, and it is believed by the builders that nothing superior in hoists can be found on any mine in this country.



The Risdon Iron Works build this style in all sizes; the facilities of this concern being fully up to all requirements. They built the great Alaska-Treadwell mill of 240 stamps, which is the largest in the world, and is reducing ore at lower cost than any other that has furnished statistics on that point. The Merced Company show the proper spirit in placing such reliable machinery on their mine.

The Mining and Scientific Press welcomes the representatives of the various county mining associations who have been delegated to attend the annual convention of the State Association next Monday, and hopes that their deliberations will result in benefit to the mining industry of the State. The character of the men chosen shows that good judgment was displayed in their selection. There is considerable work to be done in this convention for the mutual interests of the miners, and much depends upon determined, united and harmonious action. To further the work of rehabilitation of the hydraulic mining industry, to secure appropriate legislation for the quartz and drift miner, and to preserve the mineral area of the State from corporate absorption are among the most pressing present demands. The standing committees' faithful work and reports deserve affirmation,

MINING AND SCIENTIFIC PRESS.

ESTABLISHED 1860.

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J. F. HALLORAN.....General Manager

San Francisco, October 12, 1895.

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The California Miners' Association and Matters Connected Therewith.

On the eve of the Miners' Annual Convention a synopsis of the history of the associatiou, its work, the results, ensuing legislation, and the action of its committees may be of interest to many. A great deal has beeu done; a great deal remains to do, and with united and harmonious action on the part of the delegates who meet next Monday the success of the past three or four years can be continued. The following is not written in any remiuiscent spirit, but solely to refresh the minds of many as to what has been done, the great scope of the subject and the need of energetic and united effort to aid in the further development of the only present paying industry in this State.

The first of this series of conventions of the California Miners' Association was held at Pioneer Hall in this city ou January 20, 1892. J. H. Neff of Placer was chairman and W. C. Ralston of San Francisco, secretary. The object of the convention was to ask Congress to pass laws permitting the resumption of hydraulic mining in this State. A memorial to Congress was adopted setting forth existing facts and asking for relief. On October 1, '88, Congress had passed "an act for the investigation of the mining debris question in the State of California," a board of engineer officers had been appointed in accordance therewith, they had made a report, and Congress in this memorial was asked to accept and act upon its conclusions. The memorial asked Congress to make sufficient appropriations for the erection of suitable works for the restraining of mining debris, and that mining laws be amended and department rulings be modified, to the end that existing unnecessary burdens be removed from the miners of the State. There were present representative men from the foothills and valleys, and a harmonious and united spirit prevailed. The interests of all were recognized and provided for and on the third day of the convention a constitution and by-laws were drafted and the California Miners' Association was organized. Permanent officers were appointed, committees constituted, aud a general feeling was manifest that all pull together. After adjourument a committee from the association met a similar committee from the river improvement convention at Sacramento, where further conference resulted in fully harmonizing the interests of the miners and valley residents. A delegation was at once sent to Washington, which worked in unison with a similar delegation from the river improvement convention; permanent branches of the State Miners' Association were organized in the priucipal mining counties and money was freely forthcoming for necessary expenses. On February 1st, '92, Congressman Caminetti introduced two bills into Congress, one asking the Secretary of War to submit for the consideration of Congress estimates of the amounts of money which could profitably be expeuded in making the improvements recommended by the commission of engineers to restrain debris and prevent its lodgment in navigable rivers; the other to create a department of mines and mining. During that month three bills were introduced by Congressmen Geary, Caminetti and Felton, relating to mining debris, Caminetti's bill containing the principal features of the other two, and providing for the creation of a California Debris Commission, defining its duties and appropriating sufficient money to euable it to maintain official existence. The bill also provided for the erection of suitable restraining dams at various localities, and appropriated $1,670,000 for their construction. The following month the Committee on Mines aud Mining reported on the bill, favoring the creation of a debris commission, appropriating $50,000 for its expenses, and an appropriation of $450,000 for construction of restraining dams. The bill creating a department of mines and mining was also favorably reported ou by the House committee. On the 28th of May an anti-mining meeting was held at Colusa by farmers and citizens, at which resolutions were adopted protesting against the passage by Congress of the hydraulic mining bill, and an anti-debris convention called to meet at Sacramento, June 10, to make further effort to defeat the Caminetti bill. The Executive Committee of California Miners' Association passed resolntions deprecating such action and appointed a conference committee to attend the Sacramento meeting. The committee of conference were almost refused admission, but after a long debate the convention decided to admit the committee, when it was found that the committee had grown tired of waiting and had gone home. The convention disagreed with the opiuions of the Government engineers as set forth iu their report, and in a set of sweeping resolutions denounced the Caminetti bill and all connected therewith. After considerable delay and opposition the Caminetti bill passed the House, July 18th, by a vote of 143 to 43. As passed it was considerably amended; it was decided that the Government build no debris dams, that being left to the miners themselves, under regulations of a debris commission composed of U. S. Government engineers. The only direct appropriation was one of $15,000 for the commission's expenses. The bill was not satisfactory, but was the best that could be done, being largely in the naturc of a compromise. Congress adjourned before the bill had got out of the hands of the Senate Committee, so that the whole thing went over to the next session. On August 6th representatives from Sutter, Butte, Yolo, Solano, Colusa, Glenn, Tehama and Sacramento counties met at Sacramento and formed a new Anti-Debris Association. Their next meeting was at Marysville on September 22.

The second convention—the First Annual Convention—of the State Miners' Association met in Pioneer Hall, this city, November 15th, '92. The valley delegates had beeu cordially invited, but did not attend. The secretary reported the membership of the association 4378. The financial statement showed receipts as follows:

San Francisco county	$ 7,405 33
Nevada county	2,450 00
Placer county	2,002 00
El Dorado county	450 00
Trinity county	250 00
Shasta county	200 00
Plumas county	232 50
Yuba county	555 00
Sierra county	700 00
Amador county	82 50
Butte county	200 00
Total	$14,522 33

The expenditures were:

Office rent account	$ 376 10
Salary account, office sundries	1,080 67
Stationery, stamps, etc.	228 28
Office fixtures	284 30
Printing certificates, typewriting	331 37
Miscellaneous expenses	557 30
Expenses of delegation to Congress—	
J. K. Luttrell	3,888 80
J. B. Hobson	3,207 40
Niles Searles	2,535 40
R. McMurray	1,000 00
Miscellaneous expenses, telegrams, etc.	697 67
Total	$11,329 27

The resumption of hydraulic mining was fully discussed; a strong memorial was prepared to be presented to Congress, calling attention to the difficulties of obtaining patent to drift-mining ground under the rulings of the Land Office and Interior Department, and, as in the January convention, the efforts of the railroad companies to absorb the mineral area of the State was clearly commented on. The fact that the railway corporations were trying to get title to public lands which really belonged to the domain of the prospector was brought out, but it was decided best "not to antagonize the railroad influence," and the association contented itself in this regard with adopting the following:

It is respectfully suggested that to meet this difficulty Congress might take the necessary steps to determine definitely what shall he regarded as mineral and non-mineral land.

Resolved, That the interest of the gold-mining industry of California requires that Congress should pass an act the force and effect of which shall be that all lands which have ever been returned hy the United States Surveyor-General as mineral in character, or lands within the well-recognized mineral helt, shall he presumed so to he before the Land Department until the contrary is clearly shown; and that the chairman of this convention be requested to appoint a committee of five to draft such legislation as will reach the wishes of the miners of California upon this subject, report the same to the executive committee of this association for their adoption, and that the same he transmitted to our Senators and Representatives in Congress.

The Caminetti bill was discussed at great length. No one present was wholly satisfied with it, and several opposed it in the sincere hope of getting something better, but it was felt that nothing better could then be secured and that the bill had to have the eudorsement of the convention, so it was endorsed. The former officers were mostly re-elected, the regular standing committees appointed and the convention adjourned.

Early in January '93 the United States Senate Committee on Mines and Mining reported favorably on the Caminetti bill, and on the 9th of that month, after earnest debate, the California State Legislature endorsed it. The executive committee of the State Miners' Association asked Senator Felton to have consideration of the bill postponed just as it was about to pass the Senate, because in its amended form it was less than ever satisfactory to the miners. The action of the committee was indorsed by the Chamber of Commerce of this city. The bill passed the Senate February 4, '93, and went back to the House for concurrence. This was had and the bill finally passed with the obnoxious penalty clause modified. The State Legislature unanimously adopted a resolution asking the President to sign it, which he did, aud it became a law March 3, '93. About the same time State Senator T. L. Ford got a bill through the Legislature, appointing a State Debris Commissioner at a salary of $300 per month, and a secretary therefor at a salary of $125 per month, and appropriatiug out of the State general fund $250,000 to be used in the construction of restraining dams, the money to be available only when the United States Government appropriated at least an equal amount for the same purpose. [So far the appropriation is unavailable.]

The Caminetti bill as finally passed was wholly satisfactory to no one. It placed restrictions on the hydraulic miner and was antagonistic to the ideas of the valley residents. It permitted the miners to build restraining dams under the direction of a Government commission and at their own expense. It, however, committed the Government to the rehabilitation of the mining industry of the State, and was and is thus a step in the right direction. It is not all that the miners wanted or should have, but was all that so far they have been able to get.

On May 4, '93, the President appointed the members of the commission who would make operative the provisions of the bill as applying to the working of hydraulic mines in this State on navigable streams or their tributaries. They were and are Col. Geo. H. Mendell, Lieut.-Col. Wm. H. H. Benyaurd, and Major Wm. H. Heuer. Subsequently Lieut. Cassius E. Gillette was added. On June 8 the commission organized and announced itself ready to receive petitions for permits and act thereon. Applications were immediately made and after careful examination were acted upon. Since the organization the commission has constantly and impartially attended to all the applications, and though the duties imposed upon the members of the commission entails no increase in their emoluments, they have not allowed that fact to militate against continuous and intelligent attention to all the duties of the position. To date there have been 159 applications made to the commission for permits to resume hydraulic mining; of these 107 have been granted, and in almost every case the granting of the permit, after careful personal examination, has resulted in the building of the required dam and the resumption of operations, with profit to the owner and without the

slightest damage to the property of others. The efforts of the Federal commission have been opposed by the "Anti-Debris Association," who have maligned the miners, exaggerated all statements, and endeavored to keep alive strife and antagonism. Recently the board of supervisors of Colusa county, realizing that the Federal commission, duly empowered, was doing more than any State organization could do, gave notice that they would cease the former monthly contribution of $100 toward keeping up the organization known as the "Anti-Debris Association." Since then the association's efforts have chiefly been in the direction of assailing the legality of the position of the State member of the Debris Commission—John F. Kidder, of Nevada county—who since its appointment has constantly conferred and co-operated with his Federal colleagues, and in every way possible complied with the requirements of the act creating the position of which he is the incumbent.

The second annual convention of the State Miners' Association—the third meeting of that body—was held in this city beginning October 9th, '93. In his preliminary call President Neff directed attention to existing conditions, the salutary workings of the Caminetti bill, even in its unsatisfactory condition, the need for more vigorous legislation, the necessity for opposition to the opprobrious "Stewart Mining Bill," and the need for prompt action on the perversion of the mining laws by "rulings" of the Interior Department, which made it easy for a corporation to acquire title and difficult for a miner to demonstrate the mineral character of disputed land. The convention was large and harmonious. The secretary's financial statement showed receipts as follows:

Cash on hand	$ 185 14
Collections at convention, November, '92	505 50
Sale of tickets for banquet, '92	300 00
San Francisco	2,337 00
Placer county	256 70
Nevada county	250 00
Yuba county	100 00
Sierra county	100 00
Butte county	17 50
State Association certificates	19 00
Total	$4,070 84

The expenditures were:

Banquet, November, '92	$ 400 00
Headquarters and band	111 00
Convention expenses	231 64
Office rent	360 00
Salary account, secretary and messenger	760 00
Legal expenses—Drafting bills for California Legislature and legal advice thereon	428 50
Niles Searles' expenses to Washington	705 20
Expenses of Delegates Sonntag and Thornton to Trans-Mississippi convention at Ogden	300 00
Total	$3,982 45

Resolutions were adopted adversely criticising the Stewart mining bill, asking Congress to appropriate $1,030,000 for the construction of Government impounding works upon the tributaries of the Sacramento and San Joaquin rivers, and a bill therefor formulated, the regular standing committees were appointed and the convention adjourned. Subsequently the committee appointed to prepare for presentation to Congress a bill embodying the sentiment and action of the convention on several important matters affecting the interests of the miners, drew up a proposed act amending chapter VI of title 32 of the Revised Statutes relating to mineral lands and mining resources. It proposed to define in a clearer manner the method of making locations of mining claims, and outlined other legislation, including some provisions of the Stewart bill and omitting all the provisions of that bill obnoxious to the California miner. It provided that the presence of rock in place bearing gold, silver, etc., should be regarded as presumptive evidence that the land is and always has been mineral in character; made provision defining how land shall be determined to be more valuable for mineral than for agricultural purposes and brought out the claims of the prospector, locator and miner as opposed to the claims of the railroad companies. On January 14th, 1894, the executive committee endorsed the proposed measure.

The annual convention of the association met on Nov. 19th, '94, at the Metropolitan Temple in this city. It was largely attended, 540 delegates being present. For the first time in its history there were outside representations, Montana, Idaho, Utah, Alaska, Washington and other States and Territories having accredited delegates present, in response to an invitation from the executive committee, that body deeming it judicious that as relief was asked from Congress regarding existing mining laws it were well to invite co-operation from other States. The first and second State conventions had been principally devoted to the rehabilitation of hydraulic mining, though the interests of the quartz and drift miners, and the onerous rulings of the Land Department, had engaged some attention. The executive committee on November 7th announced that at the coming convention "the principal subject to be discussed is the revision of the present United States mining laws as applied to locations of claims and the proving up of mineral titles." The convention began its proceedings amid considerable enthusiasm. President Neff congratulated the miners of the State on their improved prospects and the renewed activity everywhere manifest. Gov. Markham delivered an address largely reminiscent and somewhat prophetic; Congressman-elect Barham from the first Congressional district promised in an address to do all in his power in the national legislature to aid the interests represented by the convention; Congressman Hilborn from the third district gave similar assurance; J. M. Wright delivered an address on "Object Lessons in Drift Mining;" State Senator T. L. Ford spoke at length on the question of hydraulic mining and legislation regarding it; U. S. Senator Geo. C. Perkins spoke on the mining interests of the State; A. H. Ricketts delivered an address on "Department Rulings and the Miners;" Gov.-elect James H. Budd pledged himself to co-operate with the miners in all just efforts to secure and maintain their rights; Congressman E. F. Loud did likewise; Congressman Newlands of Nevada spoke at length on the need of favorable legislation at Washington and expressed his desire to heartily aid in the work; Congressman Caminetti spoke of past legislation and future needs, and in the course of his remarks said:

> There is another matter that I think this convention ought to take immediate steps upon; and it is important, for after you pass this law you do not win this fight unless you take other steps. The great trouble, as I have found by correspondence with people who reside in Placer and Nevada, and along the line of the Pacific railroad grant, is that to-day patents are being issued to the railroad for lands that are actually mineral and ought to be given to the miner. Unless you stop that work you will lose the opportunity of getting the valuable mines that are now upon this land and have caused a great deal of trouble. Before leaving Washington, after the adjournment, I called upon the Secretary of the Interior and obtained from him the figures. The total amount of the Southern Pacific land grant in California was about 1,638,000 acres. Up to that date—June 30, 1894—491,000 acres were patented, and on the same date there were pending selections already approved by the officers and only awaiting final decision of the Secretary to be patented by the President of the United States, 414,500 acres, and the balance not as yet located and surveyed, amounting to 732,000 acres. Now, while you people are waiting, while the people throughout the district are doing nothing, the Southern Pacific Railroad, by its army of officers, by its army of perjured witnesses, is going around the district and in the land offices in this State and in Washington robbing, from the people of this State and from the miners, the land that belongs to them. You can do more good upon this question by appointing a committee to take such steps here in this convention as will stop the further issuance of these patents that are now awaiting approval by the Secretary of the Interior. That is important work for you to do, and one-half the battle can be won right here if you do but take hold in earnest and pursue the subject—414,000 acres in the mineral belt now by perjured testimony in one-half of the cases, I have no doubt, awaiting approval in order to be patented; and, once patented, no matter what the rights of the miner may have been, it will be too late then to sue and pass resolutions denouncing this, that or the other. Now is the time to act, and I hope that this convention, holding the interest of the miners of Nevada county, Placer county, and the adjoining country, at heart, will take immediate steps to call upon the Secretary of the Interior, by resolution sent to him by wire, to hold back his decision until the miners of the State can be heard, before these final selections are patented. * * * * Under this departmental made law, against the spirit of our laws, against the spirit of the mining laws, it has been intended to give this corporation lands that do not belong to them—lands that by this decision of the Supreme Court of the United States is plainly said to belong to the people, and any attempt to wrest it from the people by the means that they have resorted to is illegal and a fraud. * * * * The decision is an important one and makes plain our duty, and makes plain what the law is. It might have been declared that way years ago. New light is breaking, and at last the people are coming into their old heritage. The corporations have been notified by the Supreme Court of the United States, not only in this decision but in others, that they must stand upon equal footing with others in the community. This decision here written by Judge Field sets forth all these facts and makes our duty plain.

In accordance with a resolution President Neff appointed a committee for the protection of mineral lands from railroad grants, composed of A. H. Ricketts of Alameda, Chas. G. Yale of San Francisco, Chas. F. Hoffman of Placer, E. C. Loftus of Tuolumne, and Jno. M. Wright of Alameda. Since its appointment the committee has been actively and successfully at work and has accomplished what it was given to do. What further shall be done in this matter is for the convention that meets next Monday to say.

On the second day of the convention the committee on legislation, Messrs. Ford, Belcher and Yale, presented a comprehensive report on "Mineral or Agricultural Character of Land," showing conclusively the necessity of support of that section of the Newlands bill relating to contests between mineral and agricultural claimants of land. The same committee also made its general report, recommending important changes and modifications in existing Federal statutes, notably Sections 2322, 2324, 2325, 2335 and 2337, and recommending an act be presented to Congress appropriating $1,030,000 for construction of restraining dams and impounding works as specified. State Senator C. W. Cross delivered an address upon "Investments in Mines;" Lieut. W. F. C. Hasson read a paper on "The Successful Application of Electricity to the Operation of Mines;" R. H. Campbell delivered an address on "The Hydraulic Gravel Elevator System in Hydraulic Mining;" Congressman Johnson of the Second district pledged himself "to labor for government and to the miner;" A. H. Rose, State Commissioner of Public Works, delivered an address on how to impound debris; J. J. Crawford, State Mineralogist, read a carefully prepared paper, containing mining statistics of the State; Prof. Christy of the State University delivered an address on the mining school connected with that institution, and after several other speeches and the appointment of various standing committees, the former officers were deservedly re-elected and the convention adjourned.

The committee on the protection of mineral lands began its work on the lines of instruction laid down by the '94 convention. The apathy with which its first movements were viewed by the Land Department was changed to hostility by its continued activity. The agent of the California State Miners' Association was denied access to the public Land Office lists of lands selected by the railroad company and not until a protest from the chairman of the committee against such action reached the Secretary of the Interior was the restriction removed. By the first of last March the committee had done considerable in checkmating the efforts of the corporations to swiftly and silently secure title to hundreds of thousands of acres in several mining counties of the State. The nature of some of these selections is illustrated in "clear list 54," published in a Sacramento newspaper, where the selections embraced mineral land in mining towns, and well known gold claims, comprising a section of "the mother lode," taking in such towns as Kelsey, Gold Hill, Colfax; such mines as the Mayflower and West Damascus; such streams as Deer creek, the north and south forks of the American river; such mountain peaks as McKinstry's and Lola; such lakes as Eureka and Meadow lakes—all (according to the railroad claims) "agricultural lands." In April the executive committee sent A. H. Ricketts, chairman of the mineral land committee, to Washington to personally see the President of the United States, the Secretary of the Interior, the Commissioner of the General Land Office, and make such showing as would be fully explanatory of the justice of the position assumed by the California miners, and endeavor to secure suspension of all proceedings in patenting public lands within railroad grant limits in this State till Congress, which meets next December, could take action on the Classification bill introduced in the closing weeks of the 53d Congress. Simultaneous with his departure the Sacramento *Record-Union*, a splenetic newspaper owned and completely controlled by the S. P. Co., began a series of articles and editorial paragraphs opposing the hydraulic mines and daily devoting considerable space to attacking the only paying industry in the State. Its statements were so manifestly false, and its motives so plainly a matter of reprisal on the part of the corporation, that the effect was discounted. It has been asserted that the instigator of the attack, a gentleman prominent in the land department of the company, alleged that in this way he would make the Miners' Association muzzle the mineral land committee. Whether so or not, there shortly appeared a desire in some quarters to repress the zeal of the committee and a suggestion that less ardor in its work would be in order. Chairman Ricketts remained in Washington about a month. He visited all the officials whom it was thought of any use to see, including the President, who wrote him an autograph letter, saying that he had interviewed the Secretary of the Interior on the subject, and had

(Continued on page 234.)

The Effect of Washing with Water Upon the Silver Chloride in Roasted Ore.

By WILLARD S. MORSE, at the Atlanta meeting of the American Institute of Mining Engineers, October, 1895.

In my paper on "The Lixiviation of Silver Ores by the Russell Process at Aspen, Colorado" (Florida meeting, March, 1895), attention was called to the decrease in "chlorination" during the washing of the roasted ore with water, to remove soluble salts, before leaching with hyposulphite and Russell solutions.

This decrease in "chlorination," which is due to conversion of the silver chloride to some other form not soluble in hyposulphite solutions, and which, for the sake of brevity, will be termed the "going back" of chlorination, has been a serious obstacle to the successful operation of several leaching works, and was at Aspen the only difficulty encountered.

I have never seen any explanation of the cause of this failure to extract, in actual practice in the mill, the amount of silver chloride shown by laboratory leachings to be present in the roasted ore; and the purpose of this paper is to record the conclusions arrived at concerning the cause of the phenomenon and the data upon which they are based.

The average decrease in chlorination by washing with water in the Aspen ores for a period of fourteen months was as follows:

	Per Cent.
Silver soluble in a solution of hyposulphite of soda, in the roasted ore, when delivered in leaching vats	78.93
Silver similarly soluble after washing with water for about twelve hours	64.33
Decrease in chlorination, or silver converted from chloride to some other form, not soluble in solution of hyposulphite of soda, by the process of washing with water	14.60

The above calculations are based on results obtained in the treatment of over 30,000 tons of ore, and are computed from the average of several hundred determinations.

Mr. L. D. Godshall, at one time superintendent of the Aspen works, in a "Review of the Russell Process," advances the theory that the "going back" of chlorination is caused by the presence, in the roasted ore, of a reducing agent in the form of sulphurous acid, reducing the silver chloride to metallic silver, insoluble in hyposulphite of soda solutions, and but very slowly soluble in Russell solutions. While superintendent of the works, Mr. Godshall could devise no method to overcome the difficulty, and, in fact, beyond the simple assertion of his opinion, could advance no proof to substantiate his theory.

In the opinion of the writer, the cause of the "going back" of chlorination is principally the presence in the roasted ore of sulphides of the base metals which have escaped oxidation in roasting, and, in the case of the Aspen ores, this result was due to the zinc sulphide, which, during the rapid roasting in the Stetefeldt furnace, did not have sufficient time to decompose. It is well known that zinc blende requires more time and heat for complete oxidation than iron pyrites, and I do not think that in the short time that the ore is subjected to the heat in a Stetefeldt furnace, it is possible to decompose any appreciable percentage of zinc blende present. No difficulty was experienced in roasting in the Stetefeldt furnace charges of ore containing from 16 to 18 per cent of iron pyrites (8 to 9 per cent of sulphur), and completely oxidizing the sulphur; but the table given in this paper shows that, while the raw ore averaged only 1.98 per cent of zinc as sulphide (or 2.95 per cent of blende), the roasted ore contained 1.56 per cent of zinc as sulphide; that is, only about 21 per cent of the zinc blende had been decomposed in the roasting in the Stetefeldt furnace.

The fact that the final apparent extraction of silver in the roasted ore was, by the use of the Russell solution, brought up to 86.74 per cent, or 7.82 per cent more than the amount shown to have been present in the roasted ore as chloride, proved conclusively that, whatever form the chloride had been converted into during the process of washing, it was soluble in the cuprous hyposulphite solutions of the Russell process. This led the writer to the conclusion that the silver chloride had been converted to a sulphide, which is readily soluble in the Russell solution. It was found possible, in mill practice, to extract the silver with the Russell solutions very nearly up to the highest laboratory results.

The experiments of Malagnti and Duroscher, recorded in Percy's *Metallurgy*, showing the reactions between chloride of silver and the sulphides of the base metals, furnished a clue to the cause of the difficulty; and undoubtedly the reason for the "going-back" of chlorinations, in the case of roasted ores containing zinc sulphide, is a double decomposition taking place in the brine solution made by the wash-water and the excess of salt in the roasted ore, expressed by the equation

$$2AgCl+ZnS=Ag_2S+ZnCl_2.$$

The following table shows, I think, beyond doubt, that in the case of the Aspen ores, at least, the zinc sulphide in the roasted ore was responsible for the "going back" of chlorinations.

The determinations given were made by Mr. Stuart Croasdale. In the case of the raw ore the results given are the average of over one thousand separate analyses, made on each lot of ore comprising the run, while the determinations on the roasted ore were made in duplicate on composite samples made up from each charge of about sixty tons. The chlorination tests given are the averages of the tests made on each charge. A few slight discrepancies will be noticed in the table, where the zinc present as sulphide in the roasted ore exceeds that reported in the raw ore. These contradictions can only be accounted for by irregularities in the samples.

A number of experiments made in the laboratory by Mr. C. A. Hoyt, who allowed samples of roasted ore to stand in water in presence of an artificial zinc sulphide, showed conclusively that the silver chloride was decomposed exactly in proportion to the amount of zinc sulphide present.

In March of the present year a very complete laboratory experiment was made for Mr. C. A. Stetefeldt by Mr. Frank A. Bird of Park City, Utah, to ascertain whether the reaction occurred between chloride of silver and natural zinc blende, and thus to confirm or disprove my contention, that the unoxidized zinc sulphide left in the Aspen ores after roasting in a Stetefeldt furnace was responsible for the "going back" of chlorinations.

TABLE I.—SHOWING THE PERCENTAGE OF ZINC AS SULPHIDE IN THE RAW AND ROASTED ORE AND THE PERCENTAGE OF DECREASE IN SILVER CHLORIDE BY WASHING THE ROASTED ORE WITH WATER.

MIXTURE NUMBER.	Raw Ore in Mixture.	Zinc in Raw Ore.	Zinc as Sulphide in Raw Ore.	Zinc as Sulphide in Roasted Ore.	Proportion of Total Silver in Roasted Ore Soluble in Solution of Hyposulphite of Soda. Before Washing.	Proportion of Total Silver in Roasted Ore Soluble in Solution of Hyposulphite of Soda. After Washing.	Decrease of Silver Chloride by Washing.
	Tons.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1	1,309	2.80	2.38	2.00	83.40	61.10	22.30
2	1,231	4.20	3.47	2.59	63.83	38.90	24.93
3	2,060	4.90	4.34	2.86	75.91	43.50	32.41
4	1,319	4.50	3.74	3.16	71.16	34.00	37.16
5	1,276	3.40	3.02	2.04	80.04	63.90	16.14
6	2,435	3.20	2.96	2.07	76.62	57.04	19.58
7	3,255	3.70	2.86	2.18	76.25	57.46	18.62
8	2,123	2.10	1.56	0.82	81.80	73.20	13.70
9	2,687	2.10	1.54	1.00	84.85	81.53	3.32
10	2,656	1.55	0.86	1.15	81.96	81.41	0.51
11	2,860	1.80	1.21	0.68	82.33	79.15	3.18
12	2,602	2.80	1.56	1.64	79.72	70.06	9.66
13	2,389	2.14	1.65	1.14	79.03	69.85	9.18
14	2,033	1.58	0.99	0.97	83.36	83.12	0.21
15	541	1.73	1.14	1.05	73.21	68.68	4.53
16	961	2.08	2.06	1.87	70.90	55.90	15.00
17	410	0.90	0.84	0.89	89.70	85.70	4.00
18	1,065	1.81	1.31	1.25	74.31	61.72	12.58
19	1,911	1.92	1.60	1.36	79.85	71.99	7.86

TABLE II.—RESULTS IN TABLE I, ARRANGED IN ORDER OF THE PERCENTAGE OF DECREASE IN CHLORINATION BY WASHING.

MIXTURE NUMBER.	Decrease in Chlorination by Washing.	Zinc as Sulphide in Roasted Ore.
	Per ct.	Per ct.
4	37.16	3.16
3	32.41	2.86
2	24.93	2.59
1	22.30	2.00
6	19.58	2.07
7	18.62	2.18
5	16.14	2.04
16	15.00	1.87
8	13.70	0.82
18	12.58	1.25
12	9.66	1.64
13	9.18	1.14
19	7.86	1.36
15	4.53	1.05
17	4.00	0.89
9	3.32	1.00
11	3.18	0.68
10	0.51	1.15
14	0.24	0.97

The result of Mr. Bird's experiment shows conclusively that such a reaction occurs, and that it is more pronounced in a brine solution than in a solution of hyposulphite of soda. This would confirm my theory, as the ore roasted with 10 to 12 per cent of salt contains an excess of sodium chloride, and the wash-water becomes, practically, a brine solution.

The following is Mr. Bird's report:

REACTIONS BETWEEN ZINC-BLENDE AND SILVER CHLORIDE.

$$2AgCl+ZnS=Ag_2S+ZnCl_2.$$

"Two samples of zinc blende were used: one of crude ore, the other partially roasted. Crude ore was first ground on an iron plate to pass a 60-mesh screen, and a portion was then roasted 22 minutes, with frequent stirring, in a muffle kept at red heat. After this partial roast, the portion was regrounnd in a porcelain mortar to pass a 60-mesh sereen.

"Analysis of the crude and partially roasted ore gave the following results:

	Crude. *Per cent.*	*Partially Roasted.* *Per cent.*
Zinc	55.30	58.20
Sulphur	37.17	16.47
Lead	6.00	4.70
	Ozs. per Ton.	*Ozs. per Ton.*
Silver	4.4	5.6
Or 2.2 milligrammes in 0.5 A. T.	2.8 milligrammes in 0.5 A. T.	

"Six samples of 0.5 A. T. of each class were taken; to each of three of them was added 100 c. c. of a concentrated solution of sodium chloride containing silver (Solution A, below), and to each of the other three was added 100 c. c. of a concentrated solution of sodium hyposulphite ($Na_2S_2O_3$) containing silver (Solution B, below).

TABLE III.—SHOWING RESULTS IN FOREGOING EXPERIMENTS.

Time in Which Samples Stood in Solution.	Brine Solution, Containing 64.1 Milligrammes of Silver in 100 c. c. Crude. Assay.	Brine Solution, Containing 64.1 Milligrammes of Silver in 100 c. c. Crude. Precipitated.	Brine Solution, Containing 64.1 Milligrammes of Silver in 100 c. c. Crude. Per cent.	Brine Solution, Containing 64.1 Milligrammes of Silver in 100 c. c. Roasted. Assay.	Brine Solution, Containing 64.1 Milligrammes of Silver in 100 c. c. Roasted. Precipitated.	Brine Solution, Containing 64.1 Milligrammes of Silver in 100 c. c. Roasted. Per cent.	Hyposulphite Solution, Containing 100 Milligrammes of Silver in 100 c. c. Crude. Assay.	Hyposulphite Solution, Containing 100 Milligrammes of Silver in 100 c. c. Crude. Precipitated.	Hyposulphite Solution, Containing 100 Milligrammes of Silver in 100 c. c. Crude. Per cent.	Hyposulphite Solution, Containing 100 Milligrammes of Silver in 100 c. c. Roasted. Assay.	Hyposulphite Solution, Containing 100 Milligrammes of Silver in 100 c. c. Roasted. Precipitated.	Hyposulphite Solution, Containing 100 Milligrammes of Silver in 100 c. c. Roasted. Per cent.
Hours.	Mgs	Mgs	Per cent	Mgs	Mgs	Per cent	Mgs	Mgs	Per cent	Mgs	Mgs	Per cent
6	44.78	42.58	66.43	13.42	10.62	16.57	40.42	38.22	38.22	11.1	8.3	8.3
12	40.64	38.44	59.97	17.60	14.80	23.09	45.00	42.80	42.80	12.38	9.58	9.58
24	45.40	43.20	67.39	17.20	14.40	22.46	51.78	49.58	49.58	12.88	10.08	10.08

"After the samples had stood for the time shown in Table III, they were filtered and washed until no reaction was obtained for silver, and a hot 20 per cent solution of sodium chloride was used to wash the samples that had stood in Solution A, and cold water to wash those that had stood in Solution B.

"After washing, the residues were assayed, with the results given under the heading 'Assay,' in Table III, in milligrammes of silver. From the total silver found in the residne the amount contained in the original sample is deducted, and the remainder, being the amount precipitated from the solutions, is given under the heading 'Precipitated.' The percentage thus precipitated was calculated upon the total silver in the solution in which the sample had stood.

"*Solution A: Sodium Chloride (Brine) of 22.6° B at 60° F.*—A saturated solution, made with pure water and commercial sodium chloride, was filtered, heated to boiling, and again passed through a filter upon which was one gramme of silver, freshly precipitated as chloride. After passing it through the filter once, to loosen all particles of silver and wash it down into the filter point, the silver was washed with hot brine into the salt solution, and boiled until it was all in solution, and then the solution was made up with hot brine to exactly one liter. Upon cooling to the normal temperature, some silver chloride precipitated out, and as it was found impossible to make a stable compound, the solution was finally tested for silver, and found to contain 64.1 milligrammes per 100 c. c.

"*Solution B: Sodium Hyposulphite of 1.5° B at 60° F.*—Twenty grammes of commercial sodium hyposulphite were dissolved in pure cold water, and passed repeatedly through a filter, upon which was one gramme of c. p. silver, freshly precipitated as chloride, until it was all in solution. The solution was then diluted exactly to one liter, so that each 100 c. c. contained 100 milligrammes of silver.

"*Note.*—Before either solution was run over the silver chloride, the latter was washed until no reaction was given with silver nitrate.

"All figures are based upon the commercial assay."

Mr. Godshall, in his paper cited above, assumes that the effect produced by zinc sulphide in the roasted ore is due to the production, by the oxidation of the zinc sulphide on the cooling floor, of sulphurous acid, which reduces the silver chloride to metallic silver, and that this metallic silver is afterwards extracted by the Russell solutions. I question the correctness of this theory; since metallic silver is, at best, only slowly soluble, while sulphide of silver is readily soluble in the Russell solutions. In every case the final extraction of silver in the mill by the Russell solution was higher than the best extraction in the laboratory by hypo-solutions, showing that the Russell solution not only extracted the silver that had been changed from a chloride by washing, but also an appreciable percentage that had never been converted to chloride in roasting, and presumably remained in the ore as a sulphide of silver. The examples given in Table IV will illustrate this statement.

TABLE IV.—EXCESS OF EXTRACTION BY RUSSELL SOLUTIONS.

MIXTURE NUMBER.	Highest Laboratory Extraction by Hyposulphite Solutions. Roasted Ore.	Highest Laboratory Extraction by Hyposulphite Solutions. Washed Ore.	Decrease in Chlorination by Washing.	Final Extraction in Mill by Russell Solutions.	Extraction by Russell Solutions over best Extraction by Hyposulphite.
	Per cent.	Per cent.	Per ct.	Per ct.	Per cent.
4	71.16	34.00	37.16	80.8	9.64
12	82.33	79.15	3.18	90.5	8.17

In connection with the subject of the mutual decomposition of the sulphides of the base metals and chloride of silver, the result of turning this reaction to practical account will be of interest. During the operation of washing with water to remove the soluble salts, about 14 per cent of the silver was removed from the roasted ore by reason of the excess of sodium chloride present in it, silver chlorides being dissolved in the brine thus formed. The product from precipitation of the wash water with sodium sulphide was very low in silver (600 to 1000 ounces of silver to the ton) on account of the presence of

lead, which was also precipitated as a sulphide by the sodium sulphide.

The reaction, $2AgCl + PbS = Ag_2S + PbCl_2$, was utilized with splendid results. After a few lots of wash water had been precipitated with sodium sulphide, and a stock of precipitate, consisting mostly of lead sulphide, had been thus obtained, the wash water from the ore was run into the tanks, and the accumulated lead sulphides were thoroughly mixed with the wash water by agitating with compressed air for about two hours. The result was a complete precipitation of the silver chloride in the wash water, and the stock of precipitates first made was constantly increased in grade of silver. The saving effected was not only in the decreased cost of sodium sulphide for precipitation, but also in the decreased cost of refining the product.

In conclusion, I believe that the reactions occurring between chloride of silver and the sulphides of the base metals are of great importance in the leaching of silver ores, either with brine, hyposulphite of soda or the Russell solutions; and, from all the information I can gather, this point seems to have been overlooked by those who have investigated the subject, or at least by those who have published the results of their investigations.

The Gold-Silver Veins of Ophir.

NUMBER II.

By WALDEMAR LINDGREN.

Movement Along the Vein—Relative Age and Genesis of Vein Systems.—The opportunities for examining the junctions of the veins were not so good as would have been desirable. It seems, however, very probable that the veins of the first and second systems were formed at the same time. They do not appear to fault each other to any noticeable extent, and the Saint Lawrence vein, for instance, continues unbroken from the direction of the first vein system to that of the other. According to reliable information, it is frequent to find two veins at their crossing pinch out without faultiug; it is also said to be usual to find two veins when approaching each other simply join without faulting or cutting out. The north-south veins, which are few in uumber, are said to frequently cut off the east-west veins; so, for instauce, it is stated that the Brushfence mine is cut off a few hundred feet beyond the shaft by a heavy north-south vein, though I could not convince myself beyond doubt that such was actually the case. The flat Morning Star vein is certainly cut and faulted a few feet by a nearly perpendicular stringer running north-northeast. In the Plantz mine I aui informed that several smaller cross veins are cut and faulted, sometimes also bent, by the main ledge. The shaft is not now accessible.

Striations and slickensides are very common on the veins, and generally indicate more or less horizontal motion. At the same time it may be said with considerable confidence that no faults of large throw have taken place, for many of the veins cross the granodiorite contact without displacing it to any noticeable extent. Near the principal vein systems it is not uncommon to find the adjoining rock divided in sheets one foot or more in width. Such sheeting of the amphibolite may be noticed in Auburn ravine in the vicinity of the Floyd and the Oro Fino veins, and at several places along the vein system west of Crater hill.

The amphibolite often shows evidence of a movement parallel to the planes of schistosity, which probably in most cases took place before the veins were formed. Aloug these planes chlorite and mirrors of polished pyrites are usually fouud. The striations on the veins sometimes run down parallel with the pitch of the deposit, but it is, as stated above, much more common to find them running more or less horizontally, and they are usually most marked on the hanging wall. On the Gold Blossom vein the striations, which are often coarse, almost appearing as a corrugation of the sides of the vein, dip west from 10° to 20°. In the Conrad tunnel the inclination of the striations were measured on the hanging wall to 58° east, 50° east, and in one place 30° west. On the Hathaway the striations are very marked and dip west constantly at angles of 40° to 50°. They are not only found in the hanging wall, but in many places the whole vein, which is about 2 feet thick, is divided into sheets, produciug the effect of a ribbon structure. The faces of the dividing planes are covered by scales of chlorite and minute crystals of iron pyrites. They have a slightly wavy or curved surface and are rifled by narrow and straight striations. The thickness of the sheets varies from a few millimeters up to several centimeters. It was suggested that this structure might be due not to a sheeting of the quartz vein, but to the replacement of sheeted and striated wall rock by quartz, so that the present striations would be simply the reproduction in quartz of the original slickensides of the country rock. The faces covered with chlorite and separating the sheets might be considered as the only remains of the replaced striated country rock. Such an explanation is, however, wholly untenable. Vugs and cavities lined with crystals are often found in the thicker sheets, as well as other indications of deposition in open fissures. Moreover, many thin sections cut across the sheeted veins indicated beyond doubt that the quartz was not deposited as a mold reproduciug striations; on the contrary, indicatious of extreme pressure were most evident. The dividing planes were found to correspond to lines in the sections along which comminution and crushing had occurred to an extraordinary extent, converting the original coarse grained quartz aggregate, which still remains in many places between the dividing planes, into a fine grained aggregate.

Replacement of country rock by quartz and ores doubtless frequently occurs, but that the Ophir vein systems principally consist of quartz-filled fissures ouce open appears to me beyond doubt. It does not follow that they were open throughout, for it is common enough to find even the heaviest veins occasionally "shutting down" and the fissure narrowing to a seam, thus affording support to the walls. Moreover, it does not seem possible that the country rock could be converted into a pure coarse granular quartz aggregate without some remaining indications of its original structure. In the case of the altered wall rocks it is certain that, however profound the chemical changes, the original structure and grain have to some extent been preserved.

Mr. S. F. Emmons has recently, and with excellent reasons, called attention to the fact that "many so-called fissure veins are formed by percolating water circulating along joints, shrinkage cracks, fault planes, or zones of crushed rock, which have filled the interstitial spaces and replaced the materials of the adjoining country rocks to a greater or less extent by the materials they held in solution, but are not the filling of any considerable open cavities."

In very many cases this view is undoubtedly correct, but I do not think it can be applied to the veins described in this paper. Fissure veins with comb structure and other evidences of filling of preexisting cavities do not seem to me to be quite so rare as Mr. Emmons states, and among the gold quartz veins of Califoruia one does not have to search far to find them.

On the cropping of a quartz vein near the gravel hill two miles north of Auburn, on the Clipper Gap road, an interesting structure is observed. The vein projects for about 16 iuches above ground through the decomposed schists; its hanging appears as a smooth and polished wall. A closer inspection reveals the fact that a part of the apparently uniform surface consists of breccia of quartz fragments several inches or more in diameter, each of which is striated in a different directiou; in another part of the cropping the original striation does not seem to have been disturbed and is nearly horizontal. The explanation of this seems to be that subsequently to the movement to which the origiual striatiou was due another disturbance took place, which brecciated the vein, and that this breccia was soou afterwards pressed together and cemented. A thin section of the quartz from this place shows that it has a fine-grained quartzite structure, and that the individual grains are usually extremely pressed, broken, and crushed.

This quartz vein is at the same level as an adjacent hill of Neocene gravel and volcanic deposits, and consequently cropped out on the surface of the range in Neocene times. Nearly the same is true of the Gold Blossom and Hathaway veins, the striated surface croppings of which can only be a short distance below the Neocene surface.

It seems evident that phenomena such as those described above—sheeting, striating, brecciating, and recementing—could not have taken place except at considerable depth below the surface, and that we are, therefore, justified in believiug that a considerable extent of the vein had been already eroded in Neocene times. Just how deep the croppings on the Neocene surface were below the croppings at the time the veins were formed is not easy to tell; but the amount of the erosion is most probably not less than 1000 or 2000 feet—it may have been very much more.

Concerning the age of the veins, nothing more definite can be said at present than that they are later than the granodiorite, which again is later than the Jurassic or early Cretaceous Mariposa beds. On the other hand, they are older than the Neocene deposits overlying them.

Mr. G. F. Becker has shown that direct pressure applied to a mass presenting great resistance to deformation will induce fractures along the lines of greatest tangential strains, and four systems of fissures may be formed; in the common case, however, that there exists any inequality of resistance in the plane perpendicular to the line of pressure, the rupture will take place only along planes perpendicular to that of the greatest and least of the axes of the strain ellipsoid, aud two systems of fissures will be formed, separating the mass into columns. The direction of the compressive stress is perpendicular to these columns, and in usual cases bisects the obtuse angle between the fissure systems. An experiment by Daubree, an illustration of which is copied in Mr. Becker's paper, confirms these deductions.

These conclusions appear to offer a solution of the problem of the direction of the force which produced the principal fissure systems of Ophir.

Leaving out of consideration for the present the few and unimportant veins which run north and south, there are in the Ophir district two systems of fissures, according to the best evidence, formed and filled at the same time; roughly speaking, they cut each other at an angle of 45° and all dip southeast or southwest at angles ranging from 30° to 70°. The compressive stress that formed the fractures evidently bisected the obtuse angle between the fissure systems, that is, had a north-northwesterly direction about parallel to the trend of the Sierra, and was inclined downward at angles ranging from 30° to 70°. Most prevalent is a dip of 50° or 60°, which would correspoud to an inclinatiou of the force of 30° or 40°. The compressive stress not only produced these fissures, but, continuing to act for some time, or being repeated even after the fissures had been filled, the columns ground against each other, producing slickensides and striations.

As fissure systems with this direction are uncommon in the Sierra Nevada, it is likely that exceptional conditions produced a local compressive stress or intensified it in an uncommon degree.

As soon as the fissures had been formed they offered special faeilities for heated subterranean waters to circulate, and were soon filled with miueral solutions containing silica and carbonates, as well as small quantities of heavy metals, probably dissolved in alkaline sulphides. It is probable that the solutions already contained gold, silver, etc., derived from unkuown sources when ascending, but than encountering ecxeptionally auriferous wall rock in the iron belt a local enriching process took place. Concerning the principal source of the metals nothing definite can be said; more extensive observatiou, and especially more chemical examinations than have been made for this paper, are needed. A certain part of the gold and silver, in all probability, came from the amphibolites, but this is only referring the question one step back, for the accumulations in the amphibolites are themselves of secondary nature.

CONCLUSIONS.

The quartz mines of Ophir are located near the contact of a massif of grauodiorite of late Mesozoic age with older, post-Carboniferous, probably also Mesozoic, amphibolite schists. The latter contain belts or zones impreguated with iron pyrites in part at least auriferous, and which correspoud to the "Fahlband" of German and Swedish authors. The quartz veins principally belong to two systems, one west-northwest and the other northeast in direction; all the fissures dip southeast or southwest at angles ranging from 30° to 80°.

The principal valuable mineral is native gold, usually containing so much silver as to be classed as *electrum;* besides a small amount of sulphurets, such as iron, copper and arsenical pyrites, galena, zinc blende, tethrahedrite, and molybdenite. The gangue is principally quartz, filling the fissures, which are from a few inches to 3 feet wide. Calcite is subordinate in quantity. While practically all the quartz is auriferous, the richer ore is concentrated in pay shoots or chimneys; those in the granodiorite are low grade, rich in silver and very extensive; those in amphibolite are mostly rich, contain less silver and are of small extent in width and depth, sometimes only "pockets." When the quartz veins cross the iron belts the richest pay shoots have been found; all the pay shoots appear to have an easterly dip on the plane of the vein. The adjoining wall rock is both in amphibolite and granodiorite altered to a calcite-sericite aggregate, while there is but little calcite in the veins proper.

The fissure systems have, in all probability, been formed simultaneously by a compressive stress acting in a direction parallel to the trend of the Sierra, and the fissuring was atteuded with considerable horizontal motion. Hot siliceous and carbouated solutions containing heavy metals dissolved in alkaline sulphides ascended the veins, altering the wall rock and depositing the silica and ores iu the largely open fissures. Actiou of percolating surface waters seems out of the question. The auriferous iron pyrites of the iron belt were probably a source of local euriching of the veins, but the derivation of the largest part of the precious metal must as yet be considered an opeu question.

Bones of the "Missing Link."

A good deal of publicity has been given a recent interview with Prof. J. L. Wortman of Columbia College, N. Y., in which the professor related his find of the bones of the "missing link, a being that lived and moved 150,000 years ago." These remains of the original man were carefully wrapped in cotton and transported to the fire-proof museum in New York. The priceless bones were found by the professor and a party of scientific students near the head of the historic Bitter creek, near the Wyoming-Colorado line. The professor's interesting find has caused merriment among the old-time cattlemen of that section, as the bones were the skeleton of a pet monkey owned by cowboys, which died twelve years ago.

A tradepaper advertisement costs less than circulars and postage, is less trouble to circulate, and is sure of being read.

The California Miners' Association.

(*Continued from page 231.*)

referred Mr. Ricketts' statement to him. The executive committee met on June 6, when Mr. Ricketts made a report regarding his mission and its results. Treasurer Sonntag read a report showing that the receipts from Nov. 1st, '94, to June 1st, '95, were $4101.52, and the dishursements for the same period $4071.47. A suggestion that the railroad company was desirous of arhitration or compromise was not acted upon and a motion that the mineral land committee be authorized to continue its work and assured payment of its expenses was unanimously adopted. Suhsequently Land Commissioner Lamoreaux dismissed the protests made hy the committee against issuance of patents to the company, on the ground that they were not specific. The matter was appealed to the Secretary of the Interior.

Meanwhile the legislative committee was not idle. Under instructions from the '94 convention two hills were prepared last June, one amending chapter six of title thirty-two, Revised Statutes; another making provision for appropriation of $1,030,000 to be expended under the direction of the Secretary of War, in accordance with the plans and specifications of the Debris Commission, for the construction of works for the restraining and impounding of mining debris upon the tributaries of the Sacramento and San Joaquin rivers in this State.

The report of the California Debris Commission for the year ending June 30, '95, showed that to that date 139 applications for permits had heen received, of which 69 per cent had been granted. The report estimated that the total amount of material mined under the granted permits for the nine months from October 1st, '94, to June 30th, '95, was 900,000 cuhic yards; that available storage had been provided for 5,000,000 cuhic yards. Regarding the proposition of building permanent dams in river canyons or in the tule land of the Sacramento valley and other projects, the report said: "While the commission does not helieve any of these plans to he economical and practicable, it is unahle from lack of data to state even approximately the cost involved."

At a meeting of the executive committee on August 9th it was decided to take cognizance of the proffer of the railroad company to arhitrate the mineral land question, and that till the Octoher convention the matter he left in the hands of the present committee. A communication to W. H. Mills, representing the land department of the Central Pacific Railroad Company, was sent on the 20th of August, asking him to state the corporation's views in the matter. He replied the following day, stating his desire for concurrent action to have the entire question speedily and definitely settled. He indicated a plan which, after consideration hy the committee, was rejected, in a communication of September 17th, which outlined the terms under which the committee would he willing to treat with the company. On the 25th Mr. Mills replied, suggesting that he was empowered to act only for the Central Pacific Company. The same day the committee answered him, accepting the amendment. It was not helieved that anything would come of the negotiations. The demands made hy the corporation would not be a compromise, hut a surrender, if agreed to hy the committee, and the suggestions of the committee, while just to hoth sides, were too impartial to suit the purposes of the corporation. On October 1st Mr. Mills addressed another communication to the committee, enclosing a draft of a proposed basis of compromise, which received the earnest attention of the committee, and after consultation was, on the afternoon of the 3rd, declined affirmative consideration. The chief reason for its rejection by the committee was because of its amhiguity and indefinite construction. In a letter to the railroad representative, dated Oct. 7th, the committee sets forth in detail its reasons for such rejection. The matter was left open, and any time that the terms as proposed by the committee can he acceded to hy the corporations their overtures will receive favorahle consideration. It is not a matter of antagonism to anything or anyhody on the part of the committee, hut a desire to protect the interests of the miner and faithfully fill the trust delegated to its members at the last annual convention.

In the foregoing is briefly set forth much that has been done from the inception of the movement. That the same zeal, justice, intelligence, efficiency and harmony that have hitherto characterized the acts of the association will continue to guide its deliberatious is the sincere wish of all interested in the mining interests of our State and all the many interests connected therewith.

Concentrates.

G. W. Grayson, Jr., has bonded the Horsehead mine, Josephine county, Or.

The new 100-stamp mill of the Golden Cross Mining Co., at Hedges, Cal., hegan work last Monday.

The new 5-stamps at the Uncle Sam mine, Shasta Co., making 35 in all, hegan dropping this week.

Six more Nevada county miners leave this week for South Africa, where they have heen proffered positions.

Leigh Harnett is completing a series of well-written articles on the hydraulic mines of southern Oregon.

Sixty additional stamps and twenty-four concentrators are contemplated hy the Alaska-Mexican Co. early in '96.

Lane & Hobart, owners of the Utica mine, have bought for $50,000 the Santa Rosa mine from Cox & Stockton of Madera.

Electricity, of Octoher 2, devotes a paragraph to the absurdity of Geo. D. Burton's "refractory ore smelting electric furnace."

R. A. Davis is opening up the Sailor gravel claim in Sailor canyon, Placer Co., and expects to do considerable work next winter.

The new town at the Bulldog mine in Pinal county, Arizona, has heen named Hirschfeld, after one of the owners of the Bulldog.

Pittsburg people have bought a controlling interest in the Rosedale mine, San Marcial, Arizona, and will put up a 5-stamp mill.

H. D. Ranlett is opening up his copper mine near Ione, Amador Co. A new postoffice—Ranlett—has been established at the mine.

Articles of incorporation of the Iron Springs Gold Mining and Milling Company have heen filed in Prescott, Ariz.; capital stock, $1,000,000.

About sixty men are now employed at the Enterprise mine, Johnsville, Plumas county, mostly in preparatory work for next winter's operations.

St. Louis men have an option on the gold properties of the Bald Mountain Mining Company, located in Sevier county, Utah, the consideration heing $100.000.

Last month the Arizona Copper Company paid a dividend—the first in its history. With improved processes, the *Oasis* says, it profitably reduces 3 per cent ores.

Two steam arrastras at the Catskill gravel mine, Bangor, Cal., each grind 35 carloads of 1200 pounds each every twenty-four hours. Twenty-five men are employed.

The *Miner* figures that there are 2500 men at work in the 163 shipping mines of Cripple Creek, and that the gold output of the district is nearly one million dollars per month.

The *Democrat* thinks that ninety per cent of the people of Marysville and Yuha county are in favor of the construction of a restraining wall on the Yuba river at the foothills.

In the vicinity of French Gulch, Shasta Co., ahout sixty men are employed at the Gladstone and forty-five at the Niagara, and other mines give employment to as many more.

In the New Treasure mine, near Sunny South, Placer Co., J. B. Sellier proposes to run ahout 3000 fbet of tunnel westerly to tap the Golden river channel, now being worked from Red Point.

The Northwest Miners' Association, of Spokane, sends W. E. Everett, W. C. Butler and Duncan Ross as delegates to attend the meeting of the California Miners' Association next Monday.

A 5-stamp mill is to he huilt at the Crystal Hill mine, Butte Co., to he run by water power from the Mooretown ditch under a 235-foot pressure. G. W. Price of Forbestown is superintendent.

The Colorado men who recently purchased a controlling interest in the Sevier, Utah, gold mine for $98,000 are preparing to erect a 200-ton mill, a combination stamp and eyanide process, to cost $100,000.

Considerable Eastern capital is finding present profitable investment in El Dorado county. The Pocahontas mine, formerly a good producer, is to be reworked, and other adjoining properties are to be acquired.

The hig stack at the matte furnace of the Anaconda, Mont., company lacks a few inches of being 200 feet high; it is 60 feet in diameter at the base and 22 at the top; 2,250,000 hricks were used in its construction.

The Silver Rule group of mines have heen sold hy Laughlin Bros. to W. A. Clark of Butte, Mont., for $20,000. They are five in numher, situated four miles from Argenta, Mont., are rich in silver and carry a little copper and lead.

The South Paloma Gold Mining Company has incorporated here; directors, J. A. Wright, J. M. Cunningham, S. V. Smith, E. C. Voorhies, M. B. Kerr; capital stock, $15,000, all subscribed. The company will operate in Amador county.

Messrs. Bell, Urquhart, Harrison, Russ and Phillips of this city have organized a company to open up the Mayhell hydraulic claims near Kerby, Curry county, Or. A ditch and flume are to he huilt, pipe laid and three giants put in.

The Styne Creek Consolidated Gold Gravel Company, limited, of Vancouver, B. C., has been incorporated, capital $250,000, to acquire the property and interests at Van Winkle bar on the Fraser river in the Yale district, and consolidate.

The Tellurium group of mines on Admiralty Island, Alaska, which have heen sold for $50,000, average $15 in free gold and $110 in sulphurets. The Alaska-Willoughby Co., recently incorporated, will put up a 10-stamp mill and complete outfit.

A treaty has been signed hy the Blackfoot Indians to cede to the Government a large section of tho Blackfoot Indian reservation. The consideration is $1,000,000. The ceded portion includes some of the most valuahle mineral land in Montana.

The Carson Creek Extension mine is sold to tbe Carson Creek Mining Co. The Extension adjoins the Carson Creek on the south and extends from Carson creek to and across the Stanislaus river to Tuclumne. The mine is peculiar in tbis, that it is a solid body of limestone, through which courses the west hranch of the mother lode. It is to the close proximity of the lime that the Carson Creek mine owes its high per cent of silver values.

There is a temporary check in the financial craze in London in South African mining shares, irreverently known as the "Kaffir circus," hut the mania has not yet run its course, and not till the knowing ones hegin to unload will the inevitable crash come.

The commercial aspect of Witwatersrand mining journalism is exemplified by a ten-page advertisement of one concern, in the South African *Mining Journal* of August 31st, setting forth its status, advantages of a certain process, statistics of production, etc.

California is supplying the South Africa gold mines with experienced miners, mine foremen and superintendents, and, with other parts of the United States, machinery and apparatus. Oregon and Washington furnish timher for buildings and mine work.

The Squaw Lakes Water and Mining Company has incorporated here; capital stock, $1,152,000—J. W. Northup, $444,600; J. Knox, $444,600; W. Knox, $222,400; W. W. Thayer, $40,000; C. T. Dennis, D. Sutro, W. Gregory and A. N. Hungerford, $100 each.

The Nevada *Transcript* says the flood that occurred in the Harmony mine a short time ago has spoiled the chances of the underground ball taking place there, at least for quite awhile, as the big chamber selected for the ball-room is now very muddy and will he for some time.

Work on the Mammoth-Collins group, north of Tucson, Arizona, will be hegun November 1st. The delay was due to the illness of the new superintendent, Mr. Goodyear of London. The new Mammoth Company is now all English, the foreign stockholders having hought out the American interests.

This journal is informed that "Yuma capitalists will soon hegin the erection of a large smelting plant at Castle Dome for the reduction of lead and silver ores from the mines near that place," and that "electricity for the works will he furnished hy water power taken from the Yuma irrigating canal," hut it doesn't helieve a word of it.

Mr. John Davidson, recently connected with South American hydraulic mines, has patented a river mining apparatus and thinks his river boat can he made to pay handsomely on the Feather river. If the owners of land on that river will grant him the privilege of mining he will furnisb the machinery and labor and pay for the use of the ground out of the earnings.

Since '86, when operations hegan in the Broken Hill mine in Australia, it has yielded over 70,000,000 ounces of silver and 300,000 tons of lead. For the past six years it has paid £6,000,000 in dividends. In the first three years it paid about $500,000 a month in dividends; but since the fall in the price of silver, it has been paying ahout $250,000 a month. There are about 16,000 stockholders in the concern.

The best paying hlack sand heach mine that bas heen discovered on this coast is near Port Orford lighthouse. The claim, when first discovered nearly forty years ago, was yellow with gold for over twenty feet in width and three feet in depth, and paid $200 a day to the man. This claim is being worked this year for the fourth time hy leasers. The sand is thrown on a grizzly, carried over amalgamated plates to catch the gold and over moha'r clotb to catch the platinum. The platinum is worth $4.50 an ounce.

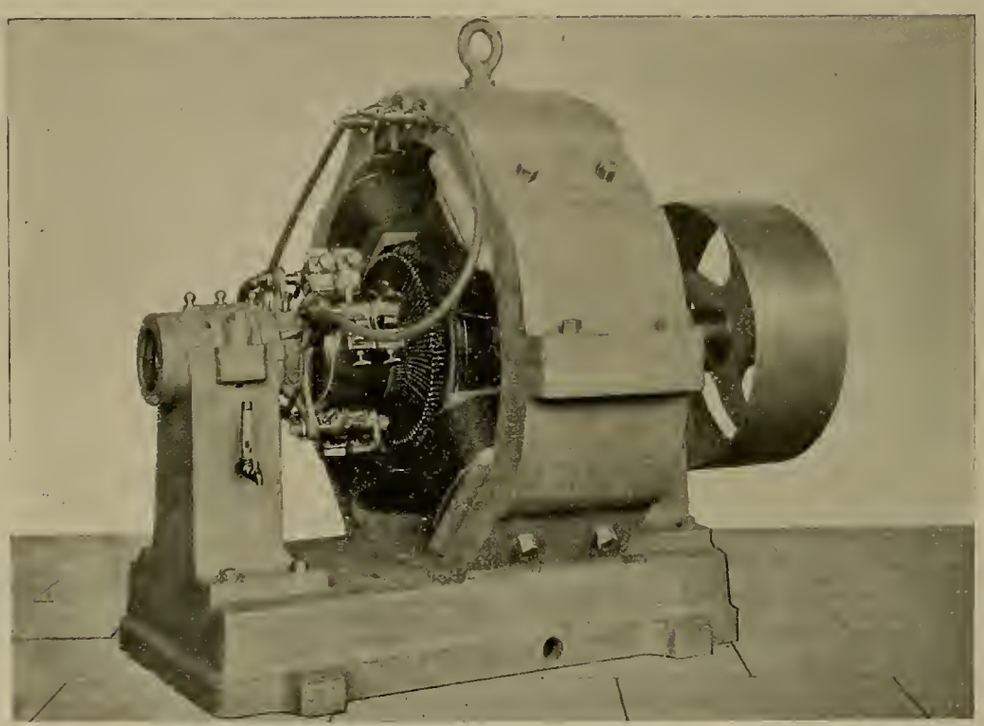
The Northwest Mining Association organized at Spokane, Wash., last week hy the election of G. E. Dennis, president; A. P. Curry, vice-president; L. K. Armstrong, secretary, and W. J. C. Wakefield, treasurer. One hundred delegates were present from all parts of the Northwest. Senator Duhois of Idaho addressed the convention on the silver question and government sampling of lead ores and F. Ganahl on mining laws. The convention was also addressed hy Congressmen Doolittle and Hyde of Washington; W. D. Gallagher of Salt Lake; C. F. Fishback of Tacoma and Governor McConnell of Idaho.

J. T. Smith of Montana, J. D. Bancroft and R. M. Green have sued John W. Mackay, E. Bind, L. Reeg and A. Head for $200,000 damages. The plaintiffs claim that last May Smith agreed, with two of the defendants, to buy a group of mines in Pleasant Valley district, El Dorado county, for $60,000 and got an option on the property. Then he offered the property to Mackay for $250,000, who sent experts to look at it. Now plaintiffs claim that Reeg and Bind ignore the terms of the option and are trying to sell the mines to Mackay; that they are injured to the extent of $200,000 and want judgment for that amount. Reeg and Bind say that the option expired September 1st; that they refused to renew it, and have a right to make such disposition of the property as they see fit.

The interest felt in Montana over the same question that the committee on protection to mineral lands of the California State Miners' Association has in charge was shown at Helena last week, when the meeting of the mineral land commission was atteuded hy the Governor, hoth U. S. Senators and many of the prominent men of the State. The commission has examined 219,690 acres, 59,250 of which are classed as mineral and 160,400 as agricultural lands. Counting every expense to the government, the cost per acre to classify bas heen 2½ cents. Excluding the cost of advertising, which under any system of classification would he necessary, the cost per acre has heen 1.8 cents. Excluding the expense of getting ready to take the field, and hasing the other expenses on the experience of the past, the actual prospective cost of classification per acre will he 1.3 cents. T. G. Merrill says: "We have sent out some 8000 hlank affidavits giving the exact location of mining claims upon each 40 acres. These specific affidavits, which have heen returned to the commission for use, cover over 10,000 acres of our mineral lands. We have also received about 300 affidavits from the owners of mining claims in unsurveyed lands giving as near the exact location of their claims as was possihle. These affidavits are placed in the hands of the United States commissioners when they are ahout to examine the lands upon which these mining claims are situated. A perfect copy of these affidavits has heen kept, in order to have them for future use if necessary. Several thousand letters have heen written to us in answer to those seeking information as to the necessary steps to he taken to secure the correct classification of the lands upon which the mining claims are located."

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Scientific Progress.

Gold Ores of Mercur, Utah.

The theory of the sedimentary origin of the gold ores of the Mercur, Utah, district is opposed by J. H. Lane, who, after a second visit to the district, has a different idea as to their origin. He claims that it is a contact vein, but does not lie as far below the surface as most veins of that character, and holds that every hill in the district has at one time carried its portion of that vein, and would to-day had it not been scoured away by the action of the elements. Another feature is that the vein is badly faulted, and it is possible for a claim to have more than one apex within its boundaries, and this idea has been demonstrated in several of the locations, some of which exhibit as many as three apexes—that is, every fault has its own apex somewhere, and several of these may occur on one location. The district, he thinks, resembles the Johannesburg, South Africa, country. In Johannesburg is a large porphyry dyke cutting the formation from east to west, and it is in the overflow or offshoots from the porphyry that are found the values—that is, in the channels from the porphyry. These channels are, or were, the channels of hot sulpho-saline and alco-saline water that formerly contained the gold in solution, which accounts for the mineralization of the lime in some places, which may penetrate to a great depth. This should aways occur on the footwall and near the porphyry dyke, where in South Africa is found the highest values. Where the values are distant from the dyke, it is nearly always on the same feeders that ultimately lead to the porphyry. His observations in Mercur lead him to the conclusion that the conditions are almost identical. The slates and talcs are similar, and in the Mercur are the same oxidized arsenical ores that are in South Africa. The channels and the general ore zone are longer and wider than in Johannesburg. The upper part of the vein is porphyry and talc, the ore lying below the porphyry, and in many instances being mineralized to an extent equalling the values in the true ores.

On the same subject, Henry Rives Ellis of this city writes us as follows:

"There has been a great deal said in relation to the Camp Floyd mining district, Utah, concerning the condition of the gold and also of the deposition of the calcareous quartz vein in which it is found. I had occasion to visit the district in the neighborhood of the town of Mercur for a limited time, and observations made under and above ground in that vicinity lead me to the conclusion that the vein is one of replacement, and not of sedimentary deposit, as claimed by some.

"The ore, or ore zone, if I may so call it—as there are two veins separated by a few feet of mineralized lime—is overlaid by a shaly rock and underlaid by lime, causing a waterway through the country through which the alkaline sulphide solutions passed, carrying the silica and metallic sulphides, depositing them *pari passu* with the taking into solution a portion of the limestone.

"The fossils, which were enveloped originally in the lime, and now in the ore, which have lead some to think that the ore was deposited by sedimentation, are merely evidences of replacement; for, as the lime enclosing the fossils was dissolved, it was immediately replaced by the ore without changing the position of the fossils, and appearing to the eye as though nothing had taken place.

"The vein is of the bedded type and was formed probably while the country was flat, or nearly so, and subsequently tilted, broken and eroded.

"It has been said very often that the gold in the ores of this district was a chloride or some other form soluble in water, the alkalies or their sulphides. This I have proved to be erroneous, and that the gold is chemically uncombined, but is in a metallic state."

The Telephone Newspaper.

The Buda Pesth telegraph newspaper was founded by Theodore Puskas, and has turned out an extraordinary success. The paper is available everywhere in the city, in places of amusement, doctors' waiting rooms, restaurants, stores of all kinds, offices of merchants, bankers and lawyers, in hospitals and in private houses, for the use of aged people to whom reading is fatiguing. Although the paper speaks all day, the information is carefully classified, and each subscriber has a programme, by which he can tell what kind of news is about to be given at any period of the day. At half past eight the day's work is begun by the reading, in a clear, sonorous voice, quite free from the nasal twang of many telephoues, of the telegrams received in the night from America and the different parts of Europe. At a quarter to nine follows the daily calendar with metropolitan news and the list of strangers that have arrived in the city up to the previous night. Then comes official news, contents of the official gazette, etc., and at specified hours are heard in turn reports on the opening of the stock and corn exchanges, local and ecclesiastical news, theatricals, art and science notices. From a quarter past eleven to half past eleven information is given on foreign, provincial and sporting matters, and then to a quarter to twelve reports arrive from the Vienna stock and corn exchange, with all sorts of military, court and political items. Early in the afternoon, when the sitting of the Reichstag begins, the parliamentary report is supplied every ten minutes. The office is in telephonic communication with the Reichstag, and it often happens that important speeches from ministers and members are known to the public while the speaker is still addressing the house. A short summary of all important items is given at noon and again in the evening for those who may have missed auy of them. Towards evening, when news is growing scarce, the subscribers are entertained with vocal and instrumental concerts, quartettes and solos, the latter being given by the most talented artists of the capital. Literary articles are often spoken into the telephone by the authors themselves. All this is given to the subscriber for one penny a day, and both wire and apparatus are conveyed to his house free of expense. There are 6000 subscribers. The organization of the staff resembles that of any other big paper. Ten men with strong voices and clear articulation act as speakers and take their turn in shifts of two at a time. When any important event is about to be read, a shrill warning blast is sounded.

Mechanical Progress.

A SUCCESSFUL PROCESS for coloring iron and steel a dead black depends upon the employment of a particular description of fluid, the formula for which is as follows: One part bismuth chloride, six parts hydrochloric acid, five parts alcohol and fifty parts water, mixed thoroughly. The article to be treated being first made clean in every respect and free from grease, the preparation is applied with a swab or brush, or the object may be dipped into it, the liquid being allowed to dry on the metal and the latter then placed in boiling water and the temperature maintained for half an hour. If the color is not so dark as may be desired, the operation is repeated, and after obtaining the desired degree of color the latter is fixed as well as improved generally by placing for a few moments in a bath of boiling oil and heating the object until the oil is completely driven off.

OXALIC ACID is now derived from sawdust. A familiar process is that in which the nitric acid and sugar are boiled for some time, then evaporated to dryness, the oxalic acid thus formed being purified by crystallization from water. A cheaper material than sugar is sawdust, an alkali being employed instead of an acid, as well as at a higher temperature. The operation is conducted in an iron vessel of proper size and shape, and either caustic soda or potash is employed, the yield beiug greater with the latter.

THE oldest industry in Great Britain—older it could hardly be, for its history has been traced back to the prehistoric Stone age—is being carried on at a village of Brandon, on the border of Norfolk and Suffolk, and is reported to be in a flourishing condition. It is a manufactory of gun and tinder box flints. The work is done in little sheds, often at the back of town-folks' cottages. It will naturally be asked, "Who wants tinder box flints and gun flints in these days of phosphorus matches aud Martini-Henrys?" The answer to the first question is that there is a good trade in tinder box flints with Spain and Italy, where the tinder box still keeps its ground in every rural district. Travelers in uncivilized regions moreover, find flint and steel more trustworthy than matches, which are useless after they have absorbed moisture. Gun flints, on the other hand, go mostly to the wild parts of Africa, where our old friend "Brown Bess," sold by auction long ago for what flint muskets would fetch, has found, it seems, her last refuge.—London News.

A DEVICE has lately been put on the market which is claimed to be a great improvement in the way of pulleys. The new pulley obviates the necessity of cutting keyways on the boss of the pulley or on the shafting, it being arranged to automatically fix itself on the shaft. In the new pulley the boss is hollowed out at one part, the bottom of the recess being semi-circular in form, eccentrically to the shaft. A steel pin is placed in this recess, and, by reason of the eccentricity of the latter, when the belt is given a slight movement the pin becomes tightly wedged, thus automatically fixing the pulley. Several advantages are claimed for the new pulley, which is stated to be in successful operation at several works in France.

SOME blacksmiths seem to think that nothing will answer for welding purposes for use as a flux except borax. This is a mistake; there is a certain flux for each metal which works better than any other flux for that particular metal. Some fluxes, however, as is the case with borax, seem to work well with a variety of metals, particularly with iron, steel, copper, lead, tin, zinc, etc. Borax is a very good flux for steel, but ordinary lime will answer equally as well. It may be stated that lime is the natural flux for steel just as fine sand (silex) is the natural flux for iron; for copper, sal ammoniac is the best flux, while for lead, tallow fills the bill.—The Tradesman.

THE failure of a grate bar is due mainly to two causes, warping and burning off at ends. To overcome warping, the bar should be made with the least amount of metal, arranged to give the required strength. Water should also be kept in the ash pit. To prevent the bar from burning off at the end it should have openings for air at the end the same as in any other part of the bar, and an open bearing bar should be used instead of a solid plate, and should be set back from end of bars so as to allow the end of the grate bar to admit air freely.

IN the Danbury, Conn., gas works are a number of very large gas engines used to generate electricity. Recently a large number of tests have been made to determine the actual amount of power being developed and the gas consumed. It was found that the average indicated horse power was 95.29, the average brake power being 83.3, thus giving an efficiency of 87 per cent. This is a much better showing than some engineers think the engines can make.

Electrical Progress.

Electrical Heating Efficiency.

The following by H. Ward Leonard gives figures that are often asked for, in a condensed and easily understood form:

UNITS.	EQUIVALENT VALUE IN OTHER UNITS.
1 K. W. Hour=	1,000 Watt hours. 1.34 H. P. hours. 2,365,400 foot pounds. 3,600,000 joules. 3.440 heat units. 366,848 Kg. m. 0.229 lbs. coal oxidized with perfect efficiency. 3 lbs. water evaporated at 212 deg. F. 22.9 lbs. water raised from 62 deg. to 212 deg. F. 8 cents at usual rates for electric heating.
1 H. P. Hour=	0.746 K. W. hour. 1,980,000 foot pounds. 2,580 heat units. 273,740 Kg. m. 0.172 lbs. coal oxidized with perfect efficiency. 2.25 lbs. water evaporated at 212 deg. F. 17.2 lbs. water raised from 62 deg. to 212 deg. F. 6 cents at usual rates for electric heating.
1 K. W.=	1,000 Watts. 1.34 H. P. 2,656,400 foot pounds per hour. 4,424 foot pounds per min. 73.73 foot pounds per sec. 3,440 heat units per hour. 573 heat units per min. 9.55 heat units per sec. 0.229 lbs. coal oxidized per hour. 3 lbs. of water evaporated per hour at 212 deg. F.
1 H. P.=	746 Watts. 0.746 K. W. 33,000 foot pounds per min. 550 pounds per sec. 2,580 heat units per hour. 43 heat units per min. 0.71 heat units per sec. 0.172 lb. coal oxidized per hour. 2.25 lbs. water evaporated per hour at 212 deg. F.
1 Joule=	1 Watt second. 0.00000278 K. W. hour. 0.102 Kg. m. 0.00094 heat unit. 0.73 foot pound.
1 Foot Pound=	1.36 joules. 0.1383 Kg. m. 0.000000377 K. W. hour. 0.000291 heat unit. 0.00000035 H. P. hour.
1 Watt=	1 joule per sec. 0.00134 H. P. 0.001 K. W. 3.44 heat units per hour. 0.73 foot pound per sec. 0.003 lb. of water evaporated per hour. 44.24 foot pounds per min.
1 Watt per. sq. in.=	8.26 thermal units per square foot per min. 120 deg. F. above surrounding air (japanned cast iron surface). 66 deg. C. above surrounding air (japanned cast iron surface).
1 Heat Unit=	1,048 Watt seconds. 772 foot pounds. 0.252 calorie (Kg.-d.). 108 Kg. m. 0.00291 K. W. hour. 0.000388 H. P. hour. 0.0000667 lb. coal oxidized. 0.00087 lb. water evaporated at 212 deg. F.
1 Heat Unit per sq. ft. per min.=	0.021 Watt per sq. ft. 0.0174 K. W. 0.0232 H. P.
1 Kg. m.=	7.23 foot pounds. 0.00000366 H. P. hour. 0.00000272 K. W. hour. 0.0092 heat unit.
1 lb. Bituminous coal oxidized with perfect efficiency.	15,000 heat units. 0.98 lb. anthracite coal oxidized. 2.1 lbs. dry wood oxidized. 15 cubic feet illuminating gas. 4.37 K. W. hours (theoretical value). 5.81 H. P. hours (theoretical value). 11,590,000 foot pounds (theoretical value). 13.1 lbs. water evaporated at 212 deg. F.
	0.33 K. W. hour. 0.44 H. P. hour. 1,148 heat units. 124,200 Kg. m. 1,210,000 joules. 887,800 foot pounds. 0.076 lb. coal oxidized.

Cum Grano Salis.

The New York *Tribune* tells a fairy story which is good enough to be true regarding the wonderful uses of the phonograph. According to the veracious journal founded by Horace Greeley, a pump works had put up one of their large pumps for the Ricks Water Company at the Elk River pumping station in California. The pump was in constant use for some

years and the makers heard no complaint until a few weeks ago, when they received a novel communication from H. L. Ricks, the manager of the pumping station. There was no doubt in the minds of those at the station who were best acquainted with the mechanism that something was wrong with the pump, but they were unable to fix on the defect; and as the dismemberment of the pump would involve much loss of time, and as a visit by an expert would mean a considerable expense, the phonograph was resorted to. The manager spoke into the receiver, describing the symptoms of the ailing pump, and further, to indicate the case, he placed the receiver so that the pulsations of the pump would be recorded on the cylinder. Just as a physician listens to the action of the heart or lungs in the human body by means of a stethoscope, so the pump doctor listened by means of a phonograph to the throbs and pulsations of the pump thousands of miles away, and was enabled by that means to diagnose the disease. A *Tribune* reporter listened to the strange communication at the New York office of the Knowles Company. The voice of the Californian is heard first giving in a clear, precise and distinct way the symptoms of the pump, and then he asks the listener to pay attention to the pump's action. Then one hears the h-r-r-r-bang! h-r-r-r-bang! of the pump and an occasional wheezing sound which might be made by escaping steam.

The engineer to whom the phonograph was submitted said that the whole record was so perfect and the speaking so plain that he felt tempted sometimes to interrupt and ask additional questions.

The experiment proved absolutely successful, and by means of the roll the disease was diagnosed. The proper remedy was suggested, and the pump is running once more "good as new."

The *Tribune* tells the story in a serious way and appears to credit it as the narration of an actual fact.

Practical Information.

In times past it has been the custom of many owners of gold mines in this State to run all their ore through a mill, regardless of its character or value. In many cases no assays are made of the rock, and its value is determined only by what is caught on the plates and concentrators. It is a well known fact that frequently high grade or rebellious ores have, by such treatment, yielded only a small fraction of their values, thus involving large losses to their owners. It is noteworthy, however, that miners are realizing the fact that, notwithstanding the higher cost of treatment, and freight, it is more profitable, on account of the high percentage of gold obtained, to sort out and ship such ores to the nearest smelter for treatment. The Selby Smelting & Lead Co., whose works are located at Vallejo Junction, have recently been making extensive improvements in their plant, thereby increasing their capacity and reducing cost of smelting, and are now offering special inducements to shippers of gold ores. Their rates will now allow shipment of those ores which previously could only be treated at the mine, or left on the dump. In this regard it is suggested that mine owners in general might find it advantageous to communicate with the Selby Co., and obtain their rates.

A CHEAP belt is always costly and will never fail to give trouble, while a first-class short-lap belt will run for a long time without any signs of crankiness. The grain or hair side of the belt is the weakest; it cracks more readily than the flesh side. It should be placed next to the pulleys for the above reasons and because it clings more tenaciously to the pulleys, due to its smooth, close surface.

CROSSED belts give the best results in driving, because of the increase in the arc of contact. The belt rubbing in passing at the cross would take from this efficiency, but with pulleys of equal, or ucarly equal, diameter this friction really amounts to nothing. Where there is considerable difference in the size of driver and driven pulley, it may make considerable difference.

NEW FACTS in welding by pressure at temperatures below the melting points of the metals have been reported by the Royal Society of Belgium. Pressed together by hand-screws, cylinders of gold, lead and tin were well united in a heat of 200 to 400 degrees for three to twelve hours, bismuth and autimouy less perfectly so. The more crystalline the metal the less was the softening.

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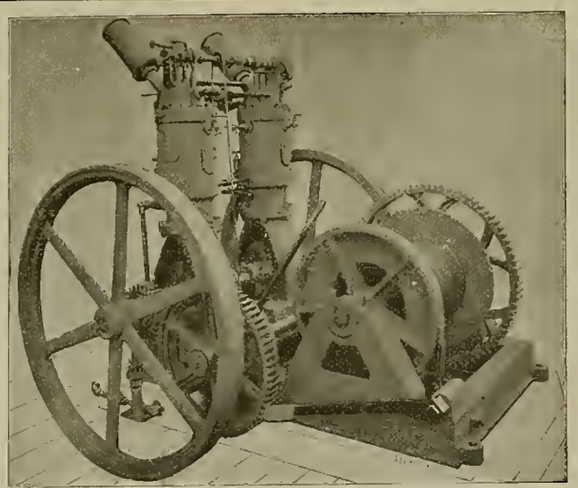
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ANCHOR COAL AND DEVELOPMENT COMPANY.

NOTICE OF ANNUAL MEETINO.

The annual meeting of the shareholders of the Anchor Coal and Development Company will be held at the office of the Company, No. 632 Market Street, Room 5, San Francisco, California, on MONDAY, the 21st day of October, 1895, at 11 o'clock A. M., for the purpose of electing a Board of Directors for the ensuing year and the transaction of such other business as may come before the meeting. E. D. FARISH, Secretary.

OFFICE.

The shareholders of the Anchor Coal and Development Company will please take notice that the office of the said Company has been removed from 19 Montgomery Street to 632 Market Street, Room 5, as per resolution of the Board of Directors.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from E. C. Hard, in the Terry Hill Mine, near Spanish Ranch, Plumas Co., to impound tailings in an old pit; from Will De Vinny, in the Lone Star Placer Mine, Cromberg, Plumas Co., to impound tailings in Jackson Creek; from Charles Jordan, in the Poor Man's Hydraulic Mine, near Placerville, El Dorado Co., to impound tailings in Taylor's Ravine; and from L. Canato and G. Oneto, in the Eagle Mining Claim, on Dry Creek, Amador Co., to impound tailings below the mine, gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Oct. 14, 1895, at 1:30 P. M.

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Mining Summary.

CALIFORNIA.

Amador.

CENTRAL EUREKA.—C. W. Randell of this city has secured an option on the Summit mine, incorporated under the name of the Central Eureka. W. R. Thomas is reopening the mine. Nearly all the former improvements have been destroyed and work has been begun on the 700-foot shaft. Mr. Thomas believes that at the depth of 100 feet he will encounter the old shaft, in good condition and the timbers sound.

THE KENNEDY.—Amador's largest gold producer reports pay rock found in the east crosscut on the 1950-foot level. Ground in that vicinity has been acquired and indications favor an increase in the output.

Butte.

THE BANNER GOLD MINE.—In the London *Mining Journal* of Sept. 21 in as account of the general meeting of the Banner gold mine. The Chairman said:—The meeting, as you all know, is held to comply with the law, which demands that the shareholders shall be called together within four months of the formation of any company. Very little news, as a rule, is put before the shareholders at such meetings, but I propose to give you a brief description of the property we own, and to tell you what the policy is that your directors propose to pursue. This course will, I think, be appreciated; because, owing to the fact that all the sbares were taken up privately, there was no need for the issue of a prospectus. Our mines are situated in one of the greatest gold-producing countries in the world, and everybody knows what enormous wealth has been extracted from California. Writers appear to differ as to whether Calfornia or South Africa carried the palm for gold production last year; but I think I am right in saying that no gold mine exists in South Africa which is producing anything approaching the yield of the great Utica mine, in California, which, I am informed, pays its lucky owners a monthly profit of £170,000. Still, there can be no doubt that California will have to do her utmost if she wishes to keep pace with South Africa. Now, I do not want anybody to infer from what I have said that I consider all gold mines in California are rich, or even good, merely because they are situated in that great gold-producing country. We all know there are failures there as everywhere else, and tbat great discrimination is needed before anyone embarks his capital in mining shares. Before I accepted the position I occupy in this company I took pains to thoroughly satisfy myself tbat the mines it owns, and its prospects, were exceptionally good. The company possesses two mines—the Banner and the Amosky—which adjoin each other, but it is to the former of these that my remarks apply, because until further development work is done upon the latter I can only tell you that the Amosky ledge has been found to be about 14 or 15 feet wide, carrying low-grade ore. It is not the intention of your directors to work upon this ledge at present, but to devote all energy to the Banner, as I shall shortly explain to you.

The mine is situated on the south-east side of Table mountain, about four miles from the terminus of the California Northern Railroad, and about five hours' run from San Francisco. We have two reports upon it, one of them being from an expert who for ability and integrity ranks, I believe, second to none. I refer to Mr. J. B. Low, of San Francisco, who, I understand, has for many years been adviser in mining matters to Mr. John W. Mackay and other mining magnates of America. I mention this because Mr. Low's report carries very great weight with us, and it is as well that I should explain the reason. The mine has had a remarkable history which Mr. Low, in his report, sums up both concisely and clearly. He says:—"The mine was located and worked by Messrs. McSmith and Sparks about 1857, and is reported to have produced $60,000 from rock, the greater quantity of which was worked by arrastras. At or immediately below the 200 level, the mine, owing to poor and insufficient timbering, caved badly, and was allowed to lie idle through a misconception of the extent of this cave. After considerable desultory efforts to open up the mine by different parties, a New York company purchased the property, and carried the shaft to the 300 level, at which point further work on the Banner was suspended, owing to the broken country encountered, and to an erroneous opinion as to the value of the Amosky vein to the east. The company after carrying out some very expensive and useless development work on the Amosky, suspended, and the mine was added to those, the reopening of which by competent men is greatly increasing the gold production of this State."

He then goes on to show what has been done since the property passed into the hands of those now interested in it, and says:—"The mine passed into your possession, and the shaft was carried below the disturbed strata to the 500 level, where a crosscut was driven west. After considerable exploration work on this level the true fissure was struck, and a rich ore body encountered in it a short distance north of the crosscut. On the 600 level the fissure is found even more perfect than it is on the 500 level, the walls carrying a heavy graphite 'putty' gouge, the vein matter filling the fissure and the blue laminated ribbon quartz showing up well: in fact, all favorable signs are present, and on this level the fissure has widened out to about eight feet between walls, an increase of about four feet in width as compared with the 300 level. The continuance in depth of such a fissure in this formation admits of no doubt, and the development of the mine shows that pay ore extends throughout the shoot from the surface to the lowest level, on the floor of which the richest rock yet taken out of the mine is found. As I have stated, the 600 level is very near the unbroken formation, and sinking will find a perfect pay-shoot, the upper and broken apex of which produced under your management $65,000. The thorough opening of the mine should be pushed by sinking the main shaft to the 1000 level, opening the fissure by crosscuts, and by steady exploration on the 500 level. I have known the Banner mine for many years, baving visited it first at the time it was being worked by its original owners; and even at that distant day I was impressed with the probability of the permanence and richness of the mine. The ledge is carried in as promising a fissure as I ever saw, and there is no doubt in my mind that it contains rich ore shoots to the south and north of the one now being worked, and that the northwest feeders encountered on the 500 and 600 levels come to the fissure from a rich and unknown ledge in that direction.

"In my judgement, from the known dip of the diabase forming the western boundary of the slate, a ledge will be found on the contact of the slate and diabase, and the mine will then take rank among the foremost producers of this State. In an experience of 46 years I have seldom been upon a more perfectly-equipped mine than the Banner; all the works are evidence of the thoroughness, skill, and economy of the management. The electric machinery runs with absolute precision, giving the very best results, and I note that arrangements are made so that steam can be coupled on should the electric power fail. I expected to find a well-equipped, well-opened, and well-managed property, but the conditions at Banner far exceed my expectations, so much so that I cannot advance a single suggestion that would in any way add to the good of the mine. With the admirable system of maps and surveys now in your possession, the future development of the mine will be an easy task. You own a most valuable property, and no time should be lost in opening it up in depth." When such an authority as Mr. Low says that we have struck the true fissure, that the continuance in depth of this fissure admits of no doubt, that the greater the depth the richer the ore, and that immediately we have sunk 300 feet or 400 feet deeper, and reach the point where the slate and the diabase come into contact, the mine will rank among the foremost gold producers in California—when he says all tbis, and in no equivocal manner, I feel that we are justified in fully believing, as we do, that we have got hold of one of California's bonanzas.

For upwards of three years development work has been pushed ahead vigorously at a cost approximating £50,000, and during this development work the ore that has been extracted and milled has yielded, up to the end of last month, nearly $80,000, the average having been £7 per ton, which everyone will admit is a remarkably good indication of what we shall find when the workings are at a deeper level. What we now propose to do is to follow the recommendation of both Mr. Low and our mine manager, Mr. W. H. Rodda, by sinking as quickly as possible to the 1000 foot level, so as to tap the rich "mother lode" there; and we propose to provide at least thirty more stamps for handling tbe ore when we reach that point, as at present we have only ten stamps running. When this work has been accomplished we have every reason to hope that the dividends will be very large, and for this reason—during the development work I have referred to—the ore encountered yielded $35 per ton, and as its richness is found to increase in depth, we may fairly calculate on getting $50 rock at the 1000 foot level, if not before we reach that point, and then with forty stamps running, the profits would admit of more than 100 per cent per annum. I am aware that this sounds very big, but when we bear in mind that various assays taken from many parts of the mine during development work ranged from $142 to $1500 per ton, I do not think we are expecting too much when we estimate on $50 per ton on reaching tbe depth I have mentioned. Mr. Rodda's report entirely coincides with Mr. Low's, both of them being agreed that the mine should be carried to greater depth without delay, and large as is the amount of gold that has been taken from the mine—about $800,000—Mr. Rodda describes the fissure from which it was taken as "merely a mineral vent for the great mother lode existing below." Our object is to attack this mother lode as quickly as possible. Our entire plant is run by electricity, which, as compared with steam, effects a very great saving. In fuel alone we estimate we save over £2000 a year. The mine is, however, provided with steam-power also, which can be coupled on very quickly should it ever be needed. This morning the following cablegram was received from the mine:—"The shaft has reached the depth of 43 feet below 600 foot level. Winze is down 41 feet below 600 foot level. Work going ahead rapidly and well. Winze is in good ore, which continues to improve with depth. Mill has been running half-time on reserve ore. The mill battery plates look very well. Everything going on well." We consider that very good news.

In the absence of questions, the Chairman concluded the proceedings by expressing the hope that at the next meeting the directors would have a good report to give the shareholders, and also a good dividend.

Mariposa.

GENERAL NOTES. — *Miner:* McKenzie & Donohoe of the Virginia mine will put in additional machinery, the tunnel will be reopened and the shaft deepened.

J. Buttgenback, owner of the Tyro mine, is supervising the opening of the lower levels.

At the Merced Gold Mining Co's property forty men are at work on the Black Creek dam. As soon as the dam is finished the erection of their new mill will be commenced. The building to be erected will be large enough to contain 210 stamps but for the present but forty stamps will be put in position. The Tuolumne ditch to convey the water for mining purposes is at present at a standstill, as the final surveys have not yet been completed.

H. M. MacLymont of Fresno is at Coulterville to take a personal supervision of the mine. The present arrastra is found to be inadequate and a mill is to be built. A fine body of ore has been met with in the tunnel which is being run to connect with the shaft. Work in the tunnel is being pushed night and day and about ninety feet more will make the connection, which will drain the shaft and make an exit for the ore through the tunnel.

Philip Corcoran, who has a bond on the eight mines of Messrs. Lindsay, Downey and Martinez, located in the Flyaway section, is about to begin active operations.

Isaac Salhinger of the Red Banks Mining Company reports work in the mine is going abead with unabated energy. The drifts and raises are being pushed along to open up and uncover the ore bodies and new work is under way.

O. F. Paulsell of Gentry Gulch, who is interested with L. N. Wilson says the five-stamp mill will be there this week.

SALE OF THE SANTA ROSA.—The Santa Rosa mine has been sold by Cox, Roberts, Stockton and Beyfogle of Madera to Lane, Hayward & Co. Theodore Allen will be the superintendent. The mine is on Little Bear creek, seven miles north of the town of Mariposa. There is a 10-stamp mill on the property.

Kern.

AMALIE DISTRICT.—The Amalie Mining Co. has struck a new shoot of ruby silver on the 200-foot level.

The country is overrun with prospectors, and all the ground for miles around the first discovery is being thoroughly prospected. Under the rules of this district there must be ten feet of work done and all monuments upon each claim prior to recording. The ore is of a concentrating character, carrying considerable free gold. The leads are usually large, in some instances being from ten to thirty feet in width.

Nevada.

THE LA BELLE SOLD.—The La Belle quartz mine, in Willow Valley district, is sold to H. B. Tomkin of tbis city, who will put up machinery without delay and open the same in a systematic manner.

TO MINE THE RIVER BED.—The *Transcript* says it is the intention of the Electric Power Co., who are now installing an extensive plant on the South Yuba river, to mine the river bed next spring and summer. The large flume that is being put in will carry nearly all the water in the river during the dry season, and by diverting this water the river can be worked for about three miles. There are a number of long stretches that have not been worked in thirty years or more, and it is believed that the tailings will pay well the entire distance. In the neighborhood of a hundred men will be employed, and the river will be worked to bedrock. The company anticipate realizing a sufficient profit from this proposed venture to offset the cost of construction of the electric plant.

Placer.

THE PIONEER MINE.—The administrators of the estate of the late Jas. G. Fair bave made a return of the sale of the estate's half-interest in the Pioneer mining property. The sale of the entire property was made to J. M. Cox and S. F. Bickford for $151,250. From this was deducted $1244.65, the expense of the sale, leaving a balance of $150,000.35, of whicb latter sum $75,002.70 was paid to the Fair estate. The administrators have since paid out of the estate's share $2500 to J. M. Brazell as a commission for making the sale.

TAKES CARE OF ITSELF.—At the Lady Bedford mine, in eastern Placer, a two-stamp mill has been used for the past two years and pays the owners. This is, perhaps, about the only mill in the county that takes care of itself. The *Sentinel* says the owners of the mine do their own work, and while they are driving ahead their tunnel or getting out ore the little mill hammers away by itself. Before going home at night the ore bin is filled and the mill hammers away all night to perfection.

AT DUTCH FLAT.—*Sentinel:* E. Mallows has completed his eight-stamp mill at the Golden Shaft and next week Dutch Flat will hear the first stamp mill that its people have heard for many years. The mine is being put in shape and in a few days the work of taking out gravel will commence. At present Mr. Mallows has seven men at work.

Plumas.

GENERAL NOTES.—Retimbering of the Thistle shaft 400 feet deep has been completed.

The Squires Bros. are sinking shafts for some San Jose men, northeast of Gibsonville, to strike the extension of the Thistle shaft channel. A steam pump is being put in place and bedrock is expected about 300 feet from the surface.

Gould and Spencer, of Gibsonville, have taken out about $6000 from their hydraulic claim at Hopkins creek, and are preparing for another season's work.

It is thought about 600 feet more of tunnel will be needed to reach pay gravel in the Tabor drift.

Sacramento.

ASSOCIATION FORMED. — The Sacramento County Miners' Association was organized in Folsom last Monday with 131 charter members. James H. Burnham was elected president and James P. Cox secretary. Sixteen delegates were chosen to attend the Miners' Convention, which meets at Pioneer Hall in this city at 10 A. M., next Monday.

San Diego.

INTERESTS TRANSFERRED. — The interests of D. C. Lane and Col. Rhorer in the Gold King and Gold Queen mines, as well as in the Cincinnati Belle, and the stamp mill at Banner, have been bougbt by Gunol Bros. of Los Angeles. Work will soon commence on all three mines.

An option on the Ranchita mine has been secured by Senora Louisa Garfilas of the city of Mexico. The purchase price of the Ranchita is $15,000 and the sale will be closed at once if the report of the expert now there is favorable.

Sierra.

THE GOLDEN STAR.—*Messenger:* The Golden Star Mining Company, recently incorporated, have just started in to work. They have begun a tunnel to crosscut their small blanket ledge, out of which the Wilson Bros. last year took $1800 in a sbort time. C. M. Wilson, the general manager, when he reaches the blanket ledge will drift on it until he reaches the main ledge, which is some eight or ten feet wide.

NEVADA.

LINCOLN COUNTY.

A MINING SALE.—The De Lamar *Lode* says: The most important transfer of mining property that has been made in Ferguson district since the purchase of the Monitor-Jim Crow group of mines by Captain J. R. De Lamar, was that concluded by Frank Wilson last week. The purchase price is not definitely known, but tbe property changed hands at a big bargain. That purchased was all of A. W. Ellis' interest, which consisted of three-twelfths of the April Fool, one-third of tbe Jumbo, one-third of the Dablin, one-third of the Lookout, one-fifth of the Swifter and one-third of the Cliff No. 2.

OREGON.

LINN COUNTY.

THE LAWLER GOLD MINES.—W. B. Lawler, managing director of the Lawler Gold Mines, Limited, an English company developing gold mines in Linn county, says the sinking of a winze in the Red Bull mine has exposed an ore vein five feet in width, without sign of hanging or foot walls, the assay value of which is $47 per ton in gold, and also carrying some silver.

The forty-stamp mill building is under construction. The extensive work being done by this company has given an impetus to mining in Linn county, and a score or more of prospectors are out in the hills of the Santiam in quest of indications. Some weeks ago the New York *Banker*, referring to the mines now under control of the English company, stated that tbe property had been sold for $500,000, which is an error. The property is not for sale, but $500,000 has been subscribed in London as a working capital, which will be used to thoroughly prospect the several claims, provide the requisite machinery and meet the preliminary demands incident to the practical development of such an enterprise.

JOSEPHINE COUNTY.

Tidings: The Farmer's Flat mines, which were sold by Mrs. M. Miller to Portland parties during 1894, are in the hands of the sheriff. The sale will take place on October 28th, to satisfy a lien of $6700 and costs.

The Donaldson-Ficke mine in Bishop Creek district, owned by Gill, Briggs & Eggert, together with the mill, etc., will be sold on October 26th, to satisfy the liens of the laborers filed against it.

Simmons, Cameron & Co., of Waldo precinct, have invested in 2000 feet of new hydraulic pipe, and will operate their mines on a larger scale than ever next season.

A three-foot vein of rich ore has been struck in the Hammersly mine, on Jump-off-Joe, at a depth of 115 feet.

WASHINGTON.

Work on the Little Chief mine, in Sultan basin, will be resumed in the spring. The principal stockholders in the company were recently there. The mine, owing to bad management, was closed down some time since.

BRITISH COLUMBIA.

THE BLUE BELL.—About forty men are employed in the Blue Bell mine, the property of the Kootenai Mining and Smelting Company. The output is about 200 tons per day. A vein of copper ore in tbe same property, which on the surface was only a narrow stringer, at 15 feet was one foot wide, and at 135 feet is seven feet in width. The property is not a mine in the general acceptance of the term, but a mountain of ore, and is quarried out. One shot will dislodge forty or fifty tons and it costs only 78 cents a ton to mine and put into the concentrator at Pilot Bay, ten miles from the mine.

WAR EAGLE.—Up to October 1st, the War Eagle mine at Trail Creek bad shipped 7025 tons of ore. The shipments averaged $48.30 per ton. From this must be deducted $10.50 for freight and treatment, $2 per ton haulage to Trail, and $4 for mining, leaving a net profit of $31.30 per ton. A new tunnel is now being run in from below to tap the vein, which it is expected to reach in 1800 feet.

THE ALBERNI.—It is doubted whether the Alberni country in British Columbia is worthy of the boom which has been inaugurated. A gentleman who is in a position to know says: "There may be something there, but the fact of its nearness to Victoria and the knowledge that twenty years ago this district was known, and nothing having been done in all that time, leads to the conclusion that there is not much there."

At the Cinnabar mine, in British Columbia, retorting has begun, and on the 28th ultimo 250 flasks had been filled and a stock of empty flasks had come in. The owners expect to find a sale among the gold mines of the province for part of the product. These properties are located at Savona.

SLOCAN. — E. J. Mathews, representing Braden Bros., agents for the Omaha and Grant smelter, has secured a bond on the Ruby Silver from W. P. Russell of Spokane;

$7500, it is said, being the purchase price. The same parties have also secured a bond on the Ajax and Treasure Vault, on Noble Five mountain.

The Gallup group of mines, on Howser creek, have been bonded to W. J. McCune of Salt Lake City. Twenty thousand dollars is the reported figure. The deal was concluded on the 23d ultimo. A contract has been let to run 300 feet of tunnel. The President is the principal claim in the group.

ALASKA.

Sum Dum, Alaska, is said to show a very rich gold mine. The Bald Eagle vein runs from 4 to 12 feet in width. A thousand dollars a day is the reported profit that a five-stamp mill is turning out.

IDAHO.

THE POORMAN.—The new ten-stamp mill of the Poorman mine in Silver City, Idaho, is completed and in operation. With the mill is a tramway 8000 feet in length, which will bring the ores to the mill. The tramway has a 10 per cent grade.

UTAH.

THE MAMMOTH.—*Tribune:* The Mammoth Company in Tintic is fast paying off its debts, and is likely to soon be again in the list of dividend payers. The approach to the big cave is rapidly being timbered up, and when it is in shape to be worked in the superintendent tells the directors that, commencing with the month of October, the ore shipments will amount to $40,000 per month. Five cars of ore taken from the cave are now on the market, and careful samples made of the interior show an average value of 40 ounces silver, 35 per cent lead and $6 in gold per ton. The cave is about sixty feet high and forty wide, but its length has not been ascertained, as it pitches into the formation at an angle of about twenty degrees.

NEW INCORPORATION. — The Black Eagle Mining and Reduction Company has incorporated in Salt Lake City; capital stock $100,000. The property of the company, which is located between Rush valley and Doremus on the Union Pacific Railway, consists of the Black Eagle, Sutro and American No. 1 and 2, in Rush valley. The properties are accepted by the company for a price representing 80 per cent of the capital stock.

MONTANA.

The Daisy mine at Cook City was purchased recently by Aaron P. Bless of Saginaw, Mich. The property was bonded by Bless a year ago.

The Florence Mining Company of Neihart, Mont., recently declared a dividend.

IN TETON CO.—Gold bearing ore has been discovered in Teton county, Montana, on Burcb creek, about 15 miles from Dupuyer. It is thought that the surface ore will run $10 per ton. About fifty men have already gone to that section.

LIBBY CREEK DISTRICT.—The development work on the Silver Cable group in the Libby creek district, consists of 900 feet of tunnels and shafts. The product of this property is free milling gold, the concentrates of which will run $100 to the ton.

THE GREAT FALLS SMELTER.—The silver smelter at Great Falls will before many days be in operation once more. A large quantity of ore is now on hand and the amount is being increased by shipments from Barker, Neihart and other points. Upon the resumption of work 120 men will be employed and the pay roll will be about $20,000 per month.

SOUTH DAKOTA.

THE MOFFATT PROCESS.—*Times:* The Moffatt Mining and Milling Company are having a revolving dryer made at the Homestake shop in Lead. As soon as it is finished the oxidizing furnace now at the Golden Star mill and the dryer will be moved to Pluma and put in place in the building prepared for them. The new process will be in operation early in November. Members of the company are fully sanguine of the success of the method in the treatment of Black Hills ores.

COLORADO.

BRECKENRIDGE MINES.—Breckenridge, which in the early sixties was a prolific camp and has produced between $30,000,000 and $35,000,000 of gold, mostly from its extensive placer deposits, has a number of mines which are, as yet, less remarkable for the extent of their development than for the variety of their gold occurrence. At the head of the Blue river there are mines working on the contact between the crsytalline schists and the overlying Cambrian quartzite. The enrichment along the contact occurs in places where small veins come up through the schists, feeding the contact, which then becomes notably gold bearing along the strike of such veins and for a limited distance on the down slope of the bedding of the quartizite. The misunderstanding of this geological structure has led to these deposits being erroneously termed "gash veins," and the failure to appreciate the relations between the limited ore measures on the contact and the fissure veins which penetrate the underlying older rocks has caused much misdirected tunnel driving.

The gold belt, of which Farncomb hill is the richest point, extends northeastward through Gibson hill, Gold run and the lateral canons which feed the Swan river. Everywhere the ore deposits are associated with porphyry intrusions which, as sheets and dykes, traverse the quartzites, shales and limestones. Sometimes the ore of a mine is found to be part of a dyke or porphyry and then there is a tendency for the miner to consider the first smooth fracture plane he meets as a wall or limit of his workable vein. There is too little cross-cutting. Often while a contact plane with lime or shale may indeed (as in the Cashier mine) be the limit of his ore, he will find that on the other side there is no true well-defined limit, but that the porphyry simply becomes less mineralized, so that the limit of his pay ore is dependent more upon the cost of working than upon any structural distinction between what is ore and what is rock. In some of the mines (as in the Double Extension) the ore occurs in floors which conform to the bedding of the sedimentary rocks, and it will be found that extreme variations in the hardness and richness of the material are due to the alteration of beds of quartzite and intruded sheets of porphyry, both of which are intersected by the main line of fissuring, called the vein. In such cases the work of opening up the mine will be made much more intelligent and successful by a careful noting of the relation between the bedding of the country, the succession of porphyry intrusions and the main dyke whose course is across them. It is unfortunately not illegal to work mines without the keeping of proper maps founded on accurate surveys, but in default of such a regulation I would emphasize the the fact that the intelligent development of a mine in such a formation without such work is a mere groping in the dark, a sailing over unknown seas without a compass, and that ordinary business sense, apart from any scientific ideas, demands the use of maps and cross sections.

T. A. RICKARD, State Geologist.

October 1, 1895.

ARIZONA.

JONES-SWANSY CLAIMS.—At Briggs, in the Castle Creek mining district, are the Jones and Swansy mining claims, situated in Yavapai county, about 100 miles south of Jerome, the property of Hill and Nortoa, of Kaasas City. A tunnel is now being run through a body of ore which runs some in gold and carries from 18 to 20 per cent copper. The ore will be reduced at the mines, there being a large smelter on the grounds, which was put in some years ago by the Copperopolis Mining Company, and is now in good shape for working.

NEW SMELTER.—George O. Bradley, who was the designer of the copper plant works in Salt Lake City, is at Clifton to design a large four-stack smelter and refinery, to be erected by the Detroit Copper Company.

A GOOD SHOWING.—Arizona's contribution of gold, silver and copper during the last eighteen years, ending June 30, 1895, was of a total value of $113,739,128. The output last year was, gold $4,260,000; silver 1,750,000 ounces at 65 cents, $1,137,500, a decrease of $563,560 from the preceding year; copper 49,661,288 pounds, an increase of 1,390,798 pounds, value $6,207,611.

Coast Industrial Notes.

—The Sacramento Industrial Improvement Association has the Ostrander gun factory for Sacramento. The offer embraces concessions for the use of electricity from Folsom at low rates.

—Joseph H. Choate of New York and Senator Stewart of Nevada have been retained by the defense associations of the State to fight the Wright law when it comes up in the United States Supreme Court on appeal from Judge Ross' decision.

—The big blast at the Otay dam, San Diego, was exploded last Sunday afternoon. At 2 o'clock 30,000 pounds of powder were touched off. It was entirely successful. The face of the hill was shattered and enough rock dislodged to afford ample material to complete the dam.

—The Manufacturers' and Producers' Association is now a regularly incorporated body. H. T. Scott is president; Julian Sonntag, first vice-pres't; W. F. Bowers, second vice-pres't; M. J. Keller, third vice-pres't; L. R. Mead, secretary; F. H. Dingle, assistant secretary; A. Sharboro, treasurer.

—The Bakersfield Gaslight Company will put in a complete gas plant to cost $20,000, including engines, boilers, buildings, purifiers, etc. The present coal system furnishes twenty-candle gas. Wallsend coal from Australia is now used, costing $15 per ton at Bakersfield. By the new system Los Angeles oil will be used.

—Articles of incorporation have been filed at Cheyenne, Wyoming, for the California, Idaho and Montana Railroad Company, which proposes to construct and operate a railroad from Butte City, Mont., to San Francisco; capital stock, $30,000,000. Incorporators—M. Lipman, New York; T. Voorhees, Philadelphia; H. M. Dickey, Chicago, and Denver and Boise City parties.

—In the past six months five large steamships, each carrying over 2,000,000 feet of lumber, have sailed from Puget sound for Delagoa bay, South Africa. In addition they have taken miscellaneous cargoes of Washington manufactured products. Three of the five steamers have loaded at Tacoma, and the sixth one of the line, the Straits of Sunda, is this week loading 2,000,000 feet of lumber for Delagoa bay.

—The J. Hammond & Co. California Car Works are building 100 flat cars, 50 box cars, 3 water-tank cars, 1 hoarding car, 1 sleeping car and 3 track-laying cars for the San Francisco and San Joaquin Valley Railroad Company, 15 electric street railway cars for the Seattle Consolidated Street Railway Company of Seattle, Wash., and 155 electric street cars for the Market Street Railway Company of San Francisco.

—At a recent joint meeting of the Board of Prison Directors and the Bureau of Highways in Folsom, to examine bids for machinery for the rock-crushing plant, the Union Iron Works submitted five bids, two of which were for $19,250. The others were for $16,000, $18,000 and $15,500. The Pelton Water Wheel Company put in two bids, one for $16,000 and another for $16,450. The Risdon Iron Works submitted a bid of $7693, and the American Road Machine Company, a Pennsylvania firm, a bid of $11,630. The $15,500 bid of the Unioa Iron Works was accepted.

—The Los Angeles Oil Exchange has agreed to San Francisco propositions and a contract has been signed providing for a freight steamer to ply between San Pedro and San Francisco. Oil shipments will be made by rail from Los Angeles to San Pedro, but a pipe line will ultimately be built. The exchange guarantees sufficient oil to keep the vessel busy. There is a demand here for 1000 barrels daily. The contract will be three years.

—By damming Cedar river, Wash., and raising the level of the water in Swan lake twenty feet, the Cedar River Power Co., of Seattle, Wash., expects to generate sufficient electrical power to run all the Seattle and Tacoma machinery, light both cities, and, incidentally, supply water. The longest transmission is eighteen miles. The company's capital stock is $500,000. Incorporators—E. H. Ammidown, M. McMicken and T. A. Noble, of Seattle.

—A new coal field in Arizona is under exploration and development, in the Whetstone mountains, fifteen miles from the railroad. The ledge is twenty-five feet thick and five miles long. Eleven claims have been taken out along the vein. One shaft will be put down seventy feet deep, to tap the vein from below. The owners are R. R. Richardson, J. Woodrum and nine others. The Southern Pacific has expended considerable money at Solomonville exploring for coal.

—Dr. Chas. Van Orden, representing the South Yuba Canal Company, has asked the Sacramento Board of Supervisors for a franchise for the Central California Electric Company to enable it to bring electric power through the county to the city of Sacramento. He says they have from 1700 to 2000 horse power at this time which they desired to bring into the Capital City. The power-house is only twenty-nine miles from the State Capital. Their pole line now extends to Rocklin, twenty-one miles from Sacramento. The matter has been taken under advisement.

—The Pacific Transmission Co. has incorporated: capital stock, $3,000,000: object, to generate electricity and electric power, and their transmission to the county of Alameda, the cities of Stockton, San Jose and other cities and towns of the State. The Treadwells are credited with owning three-fifths of the stock. They are the owners of the Corral Hollow coal mines, the Alameda & San Joaquin Railway Co., and the stated intention is to put up an $800,000 electric plant at the mine, utilize the "slack," or waste coal, and generate 6400 H. P., build pottery and cement works and supply power to a region seventy-five miles round about. The scheme is a very comprehensive one. It is probable this power business may be a little overdone after awhile. It might be well to devote more attention to creating new or increased demand for power.

—It is now proposed to transmit electrical power from the Kern river to Los Angeles, there to be used for lighting and power purposes. The distance from the headworks near Kernville to Los Angeles is 108 miles. The power is to be carried by wire this entire distance. It is claimed that, even with the enormous expense incurred in the construction of the line, which will amount to about $1 a foot, power can be furnished there cheaper than it can be produced by coal or oil. Enormous capital is required for the construction of such a plant and line, and the men who are manipulating the financial end of the scheme will endeavor to float not less than $2,000,000. Surveys are being made for the canal, into which it is proposed to divert the waters of the Kern river. The canal is to be twelve miles long, with a fall of twenty feet to the mile. The proposed route of the line is to be over the Tehachapi mountains, through Antelope valley, near Elizabeth lake, through Soledad canyon, near Lang's station, approaching the city by way of San Fernando valley. The idea appears visionary, but nothing in these days is to be considered impracticable.

Publications Received.

"*Handbook of British Columbia Mining Laws*;" a very complete compendium of legal requirements for the working and ownership of quartz or placer claims in that province. Sold by J. H. Brownlee, Box 815, Victoria, B. C.; price 25 cents.

"*Year Book of the Society of Engineers, University of Minnesota, Minneapolis, Minn.*;" technical articles in engineering, metallurgy, railroading, electricity, etc.; 137 pp.; price 60 cents.

"*The Journal of the Franklin Institute for October*," containing an article on "Irrigation, with an example of its application to the arid region of western America," by A. B. Wyckoff; "Engineering Education and the State University," by W. S. Aldrich, University of West Virginia; "An account of the Gardiner Lyceum, the first trade school established in the United States," by J. H. Cooper; "Electro-Metallurgy as applied to Silver Refining and, incidentally, to other Metals," by Geo. Faunce, B. A. S., superintendent Pennsylvania Lead Co.; with the usual interesting "Notes and Comments."

"*Cantor Lectures on Recent American Methods and Appliances Employed in the Metallurgy of Copper, Lead, Gold and Silver*," by Jas. Douglas, delivered in London last April and May before the Society for the Encouragement of Arts, Manufactures and Commerce.

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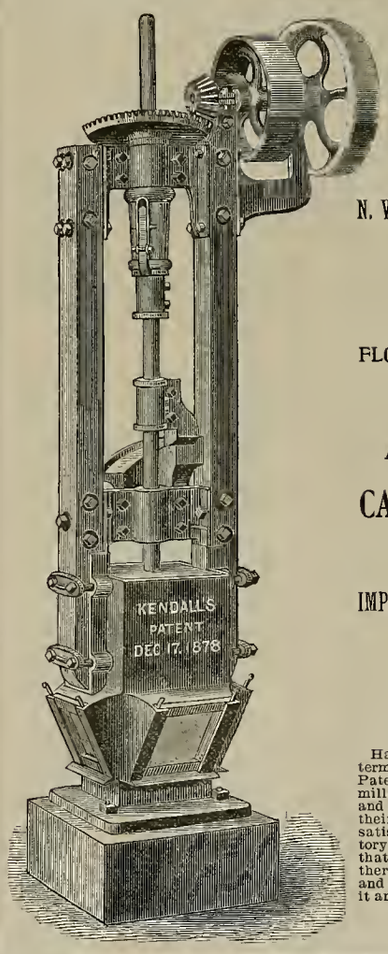
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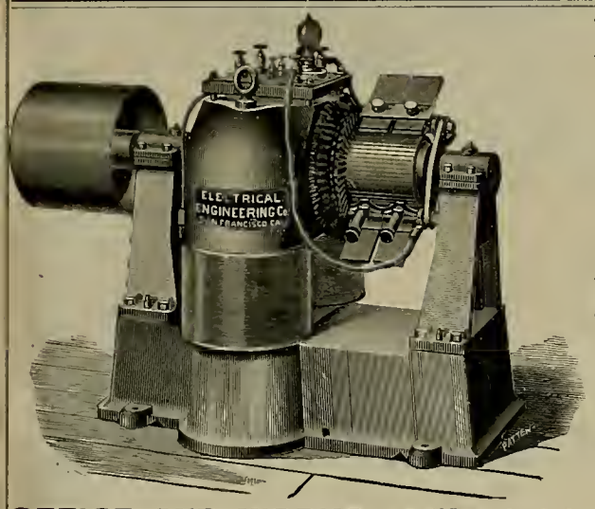
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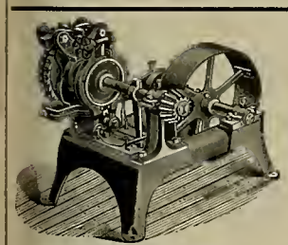
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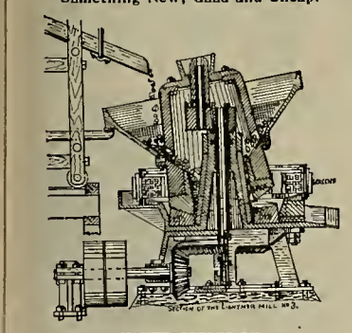


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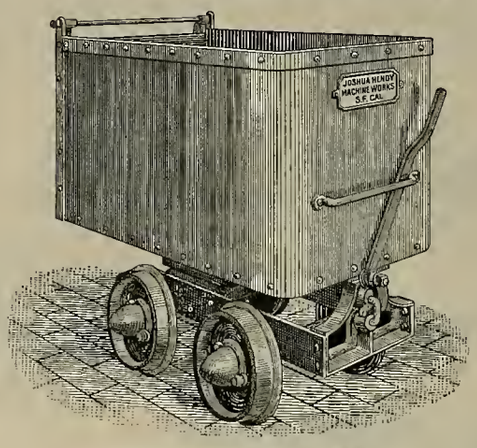
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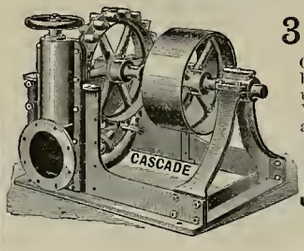
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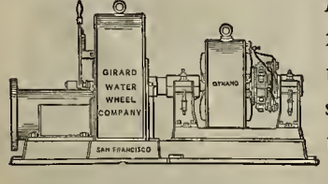
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List of U. S. Patents for Pacific Coast Inventors.

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FOR WEEK ENDING OCTOBER 1, 1895.

547,194.—WASHING, ETC., FRUIT—W. C. Anderson, San Jose, Cal.

547,199.—BOILER FLUE CLEANER—Booth & Wade, Los Angeles, Cal.

547,337.—SHIP'S LADDER—M. Deane, S. F.

547,338.—WAVE POWER—T. Duffy, S. F.

547,340.—BARBED WIRE STRETCHER—H. L. Farrier, Oakland, Cal.

547,345.—TRACTION ENGINE—P. H. Flansburg, Los Banos, Cal.

547,116.—AMALGAMATOR—Hamlin & Conveau, S. F.

547,074.—HYDRAULIC GIANT—J. H. Heady, S. F.

547,258.—SAFETY GUARD FOR CARS—H. H. Henley, S. F.

547,215.—ELECTRIC DRILL—Jamison & Edmunds, Vallejo, Cal.

547,278.—FRUIT BOX—C. A. Newcomb, Riverside, Cal.

547,154.—DITCHING MACHINE—F. E. Odell, Glendora, Cal.

547,181.—FLOWER PIN—E. E. Park, S. F.

547,357.—WHEEL—C. T. Pelton, Riverside, Cal.

547,241.—PIGMENT—F. Salmithe, Santa Paula, Cal.

547,295.—VARNISH—F. Salmithe, Santa Paula, Cal.

547,186.—DOOR BELL—I. E. Shaw, Cloverdale, Cal.

547,187.—MESSAGE RECEIVER—I. E. Shaw, Cloverdale, Cal.

547,188.—LATHE ARBOR—J. P. Simmons, S. F.

547,191.—CARPET SEWING MACHINE—C. C. Volberg, Alameda, Cal.

547,162.—PUMP—J. W. Wheeler, Centralia, Wash.

547,192.—PLOW—A. D. Williams, Lafayette, Cal.

547,063.—RATCHET DRILL—C. A. Williams, New Whatcom, Wash.

547,314.—BED PAN—Susan C. Wolfskill, Winters, Cal.

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Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

WATER BANDAGE.—Benjamin F. Springsteen, San Francisco, Cal. No. 546,436. Dated September 17, 1895. The object of this invention is to provide a water-containing flexible vest, with means whereby the water is retained evenly in all compartments of the vest, and also to provide a means by which the water in any one or more of the compartments may be maintained at any desired temperature. It consists of a water-tight fabric adapted to surround the body of the patient, separable at the side and consisting of an inner and outer wall of flexible imperforate material, partitions or diaphragms extending in the direction of the length of the vest in parallel series and arranged on edge so that they may be connected directly with the inner and outer walls, to hold the same separated and to form independent water chambers. These diaphragms have openings made transversely, so that the chambers may be connected with each other, and pipes enter the space between the walls at different levels, and are connected with a heating coil, which is fixed in a furnace or apparatus, whereby the water may be heated and circulated through the vest. A spring-actuated safety valve is attached to the delivery pipe of the heater having a tension such that a slight increase of the pressure will open the valve and allow the water to escape, thus checking the circulation, or, if a sufficient quantity escapes, it will flow down and extinguish the lamp.

FLOWER PIN.—Edward E. Park, San Francisco, Cal., assignor of one-half to Joun W. Davis, of same place. No. 547,181. Dated Oct. 1, 1895. This invention relates to a device which is designed to secure flowers and boutonnieres to a garment, and for other purposes for which it may be useful. It consists of a slender flexible wire having one end sufficiently pointed so that it may be inserted through the stem or through the base of the flower, close up to the flower itself, and then bent so as to prevent its being pulled out. The wire is then wound around the stem as many times as may be desired and the opposite end has a yoke formed upon it of sufficient stiffness so that it can be hooked into the fabric and thus retain the flower in place. This wire serves to strengthen the stem and prevent its being broken, or if broken it takes the place of the stem and retains the flower in position.

DOOR BELLS.—Isaac E. Shaw, Cloverdale, Cal. No. 547,186. Dated Oct. 1, 1895. The object of this invention is to provide a bell with freely movable hammers, adapted to rebound immediately after striking the bell so as to leave the latter free to vibrate and produce a clear unimpeded tone. The bell or gong is suitably fixed upon a horizontal axis, and a slotted tube is arranged within it, supported independently of the ground, with the outer ends inclining upwardly from the center in each direction toward the interior periphery of the bell. Within this tube are two balls, adapted to roll in any direction from the center. A spring arm extends upwardly between the two balls, and by means of a cam and turning device this arm may be withdrawn to either side of its central position. When released it will return and strike the ball upon the opposite side and force the latter against the bell to produce a sound, the ball immediately recoiling and rolling back to the center by gravitation.

EXPANDING LATHE ARBOR.—John P. Simmons, San Francisco, Cal. No. 547,188. Dated Oct. 1, 1895. This invention relates to a lathe arbor or mandrel, and an expansible mechanism connected therewith, and adapted to receive and hold any articles, such as pulleys, etc., which are to be turned. It consists of a mandrel or arbor made cylindrical and of essentially the same size from end to end, longitudinal key-ways formed therein increasing in depth from one end to the other, keys or feathers fitting and slidable within the key-ways having head portions, the sides of which are channelled to form radial grooves and tongues, a non-rotary collar slidable longitudinally upon the mandrel having its inner portion slotted radially to form tongues, and grooves adapted to engage the radial grooved sides of the heads so that the keys are movable with the collar and are at the same time allowed a radial motion. A nut is adapted to be screwed upon the arbor, and has a supplemental flanged two-part ring screwed into one end, with a flange fitting a corresponding groove or channel in the collar so that the rotation of the nut will advance the collar and feathers or keys in either direction, a stop pin extending through the collar into one of the key-ways, so that its point will strike the bottom near the shallow end to prevent the collar from being removed from the mandrel.

LETTER AND MESSAGE RECEIVERS.—Isaac E. Shaw, Cloverdale, Cal. No. 547,187. Dated Oct. 1, 1895. This invention relates to a device for receiving letters and temporary written messages and information memoranda. It consists of a fixed box, having a hinge-door opening outwardly from the front, with a means for securing it in a closed position, guides and vertically moving tablets having information printed thereon and slidable in the guides upon the door; a drum journaled in elastic standards, adapted to receive a roll of paper; an opening in the door and a table sunken below said opening, over which table the paper passes from the containing roll; a second drum upon the opposite side of the opening and table upon which the paper is rolled after the message has been written; a pawl and ratchet-wheel, the shaft of which extends through the side of the box, with a knob upon the outside whereby it may be rotated in one direction, and a lug or stop which prevents its being rotated in the opposite direction whereby the message may be written upon the exposed part of the pad and then rolled upon the drum concealed within the case, where it will remain until removed by the proper person without being exposed to any one else. Any number of such messages may be written upon the exposed surface of the pad, each one being in turn coiled upon the concealed drum. The illustration which accompanies this gives a good idea of the appearance of the device as it is constructed in readiness to be fixed upon an office door or other convenient point.



New Machine Works.

As an evidence of the improved condition of business, new enterprises are springing up in the city almost daily. One of the latest of these is the new machine shop just started by A. J. Van Drake at 143 First street. After an absence of more than a year, Mr. Van Drake returns to his old field of labor—fine machine work—wherein he has worked with success for so many years. Among machinery workers in the city, and over the coast generally, Mr. Van Drake is known as one of the most skilled men in his line. His new works are complete, with every modern appliance for turning out fine work quickly, including a Brown & Sharpe gear cutter of the latest pattern and large capacity—the only one of the kind in the city. This thorough equipment, supplemented by experienced and skillful assistants, will enable the new shop to sustain the reputation so long enjoyed by the old and to meet the increasing demands of the better times. *

Delegates, Attention!

There will be found on another page of the PRESS a general invitation to delegates to the Miners' Convention and all mining men, issued by the National Base Ore Reduction Company, to visit its works, near Shell Mound, Oakland, and investigate its new and cheap process for handling all refractory ores. Mr. A. J. Robinson, the general manager, will be pleased to see those who are interested, at the company's principal office, room 170, Crocker building. *

The Improved Huntington Roller Mill.

Those interested in working ores who are not already familiar with the above mill will benefit themselves by becoming acquainted with its merits at an early day. The cut of the improved mill to be seen elsewhere in the PRESS gives a very good idea of the mechanical principle involved. *

The Krogh Manufacturing Co.

The attention of mining men is called to the advertisement of this well known manufacturing company, to be found on another page. The Krogh pumps and mine hoists are in extensive use and are well worth the close investigation of visiting miners at this time. *

Electricity for Mines.

The utility of electrical mining apparatus is now generally recognized in California, as well as elsewhere, and some of the leading mines of the State are equipped with complete electrical plants, furnishing light and power, cleanly, efficiently and economically. Those interested in this important matter are invited to call at the headquarters of the Electrical Engineering Co., 34 and 36 Main street, where electric power apparatus for all departments of mining work is made a specialty. *

Save the Gold? Yes!

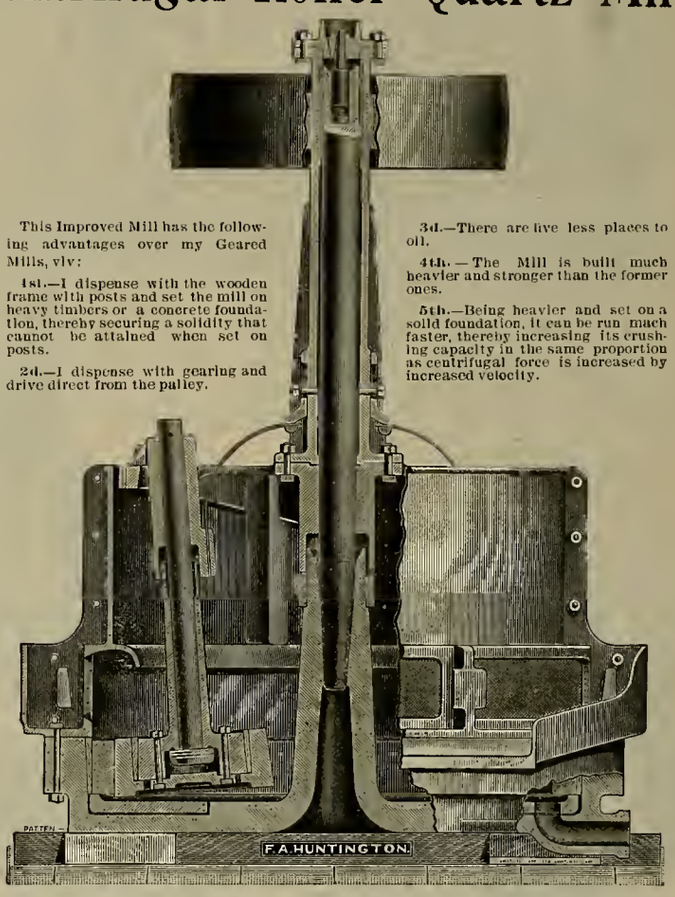
The present is a good time for practical miners to look into the merits of the new "Gold King" amalgamator. The works are at 114 First street, where every facility is afforded for a thorough investigation of what is claimed to be the best gold-saving device yet invented. Mr. A. C. Rumble, general manager for the Midas Gold Saving Machinery Co., will explain the amalgamator to those who may call. The company's announcement will be seen on another page. *

Wire Rope.

The old house of John A. Roebling's Sons Co. at 25 and 27 Fremont street, whose business announcement appears on another page of the PRESS, are prepared to meet every requirement of the mining interests for iron, steel and copper wire for tramway, hoisting, electrical or any other purpose. Get their catalogue. *

F. A. HUNTINGTON'S NEW IMPROVED

Centrifugal Roller Quartz Mill.



This Improved Mill has the following advantages over my Geared Mills, viz:

1st.—I dispense with the wooden frame with posts and set the mill on heavy timbers or a concrete foundation, thereby securing a solidity that cannot be attained when set on posts.

2d.—I dispense with gearing and drive direct from the pulley.

3d.—There are five less places to oil.

4th.—The Mill is built much heavier and stronger than the former ones.

5th.—Being heavier and set on a solid foundation, it can be run much faster, thereby increasing its crushing capacity in the same proportion as centrifugal force is increased by increased velocity.

Manufactured by F. A. HUNTINGTON,
143 First Street, San Francisco, Cal.

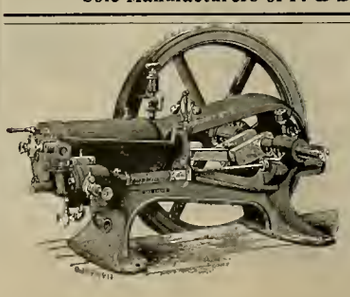
P. & B. INSULATING TAPE.
ARMATURE VARNISH.
ELECTRICAL COMPOUND.

STANDARD OF EXCELLENCE—USED IN ALL FIRST-CLASS ELECTRICAL WORK.

Samples and Circulars on application.

PARAFFINE PAINT CO. 116 BATTERY STREET, SAN FRANCISCO. 221 SOUTH BROADWAY, LOS ANGELES.

Sole Manufacturers of P. & B. Paints, Roofing, Building Papers.



PERKINS'
GAS, GASOLINE OR OIL
ENGINE.

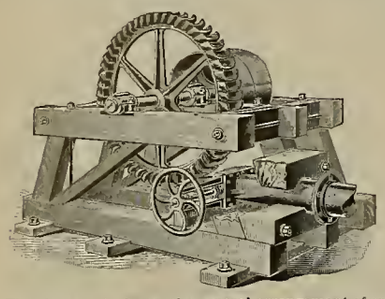
Modern, Economical, Reliable. Leads all others in few parts and low prices. Adapted to every purpose where power is required.

PERKINS PUMP AND ENGINE CO.,
117 Main Street, ... San Francisco.

RISDON IRON WORKS.

OFFICE AND WORKS, COR. BEALE AND HOWARD STS., SAN FRANCISCO.

CABLE ADDRESS, "RISDON'S," SAN FRANCISCO.



The above cut shows the general arrangement of one of Knight's Standard Water Wheels, of which there are more than 350 in use in California alone. These wheels are made from 2 feet to 6 feet in diameter, from 10 to 1000 horse power, and adapted to all heads and purposes.
Descriptive circulars mailed free on application.

—— MANUFACTURERS OF ——

JOHNSTON CONCENTRATORS,

IMPROVED BRYAN MILLS,

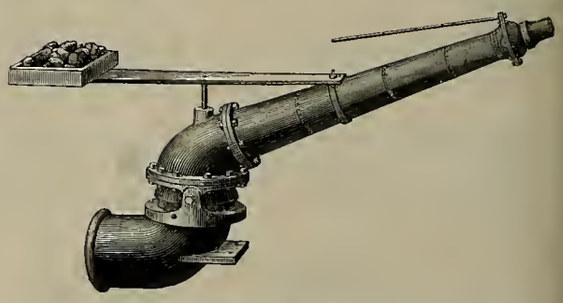
RISDON ORE FEEDERS, "Challenge" Type.

AIR COMPRESSORS,

MINING, MILLING, PUMPING AND HOISTING PLANTS,

GOLD AND SILVER STAMP MILLS.

CATALOGUES AND PRICES ON APPLICATION.



IMPROVED HYDRAULIC GIANT.

The above cut illustrates the improved form of Hydraulic Giants, in which the Center Bolt is dispensed with, which was so liable to catch trash.
Prices and catalogues of our specialties sent free on application.

The Edward P. Allis Company, Milwaukee, Wis.

Established 1860.

Reliance Works.

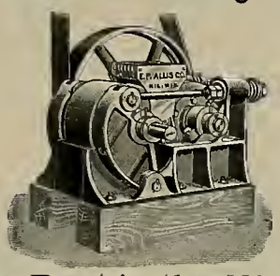
MINING, MILLING AND SMELTING MACHINERY.

Crushers, Rolls, Jigs, Concentrators, Screens, Stamps, Pumps, Compressors, Hoists, Boilers, Etc., Etc.

Reynolds Corliss Engines.

WORK THE BEST. PRICES THE LOWEST.

The Reliance Crushing Rolls.



The Best in the World.

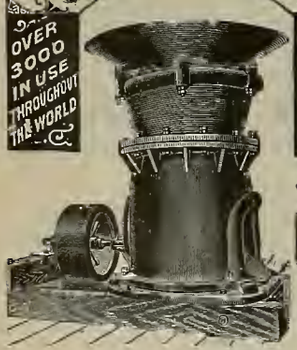
BRANCH OFFICES:

San Francisco, Cal.....9 Fremont Street.
Butte, Mont.....30 W. Granite Street.
Salt Lake City, Utah.....73 So. Main Street.
Denver, Col.....427 Seventeenth Street.
Minneapolis, Minn.....416 Corn Exchange.
Chicago, Ill.....509 Home Ins. Building.
Kansas City, Mo.....43 Armour Building.
Pittsburgh, Pa.....German National Bank Building.
New York City.....26 Cortlandt Street.
City of Mexico.....Calle Gante, No. 12.

WRITE FOR OUR NEW CATALOGUE.

GATES ROCK AND ORE BREAKER

OVER 3000 IN USE THROUGHOUT THE WORLD



PRODUCES A MORE PERFECT CUBIFORM MATERIAL AND A GREATER QUANTITY IN A GIVEN TIME PER HORSE POWER USED THAN ANY OTHER CRUSHER ON EARTH.

CAPACITIES UP TO 150 TONS PER HOUR. NINE DIFFERENT SIZES.

WE HAVE BUILT THE LARGEST STONE CRUSHING PLANTS IN EXISTENCE

GENERAL MINING MACHINERY

OF EVERY DESCRIPTION.

TREMAIN STEAM STAMPS

Connorsville Blowers, King-Darragh Concentrators, Stamps, Hoists, Rolls, Pans, Settlers, Smelters, Metallurgical Appliances, Etc.

COMPLETE INSTALLATIONS.

Investigate our late Specialties and Improvements in this class of Machinery.

GATES IRON WORKS Dept. "M," 650 Elston Ave. CHICAGO, ILLS., U.S.A.

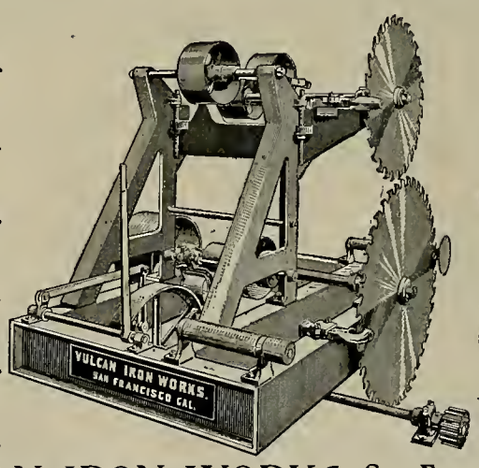
NEW YORK, 136 LIBERTY ST. | LONDON, E. C., 73 A QUEEN VICTORIA ST. | BUTTE, MONTANA. | CITY OF MEXICO, 8 CALLE DE GANTE

Portable Saw Mills.

No. 0 Single Circular. 4000 - 6000 feet per day.

No. 1 Single Circular. 8,000 - 10,000 ft. per day.

No. 2 Double Circular. 15,000-20,000 ft. per day.

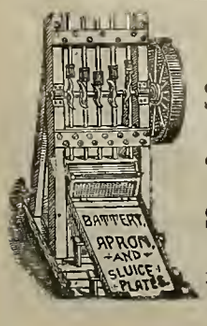


For Mining Companies —OR— Other Consumers of Lumber at Remote Points.

SEND FOR CATALOGUE.

Manufactured by

VULCAN IRON WORKS, San Francisco, Cal.



To Gold Miners!

Silver Plated Copper Amalgam Plates For Saving Gold.

GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

SAN FRANCISCO GOLD, SILVER AND NICKEL PLATING WORKS, 653 and 655 Mission Street, San Francisco, Cal. Telephone, Main 5931.

E. G. DENNISTON, - - - - - - - - - - Proprietor.
Every description of work plated. Send for Circular.

Attention Miners!

W. W. MONTAGUE & CO.

—— ARE MANUFACTURERS OF ——

Riveted Iron and Steel

Water Pipe

For Hydraulic Mining, Mills and Power Plants.

RON, CUT, PUNCHED AND FORMED, AND TOOLS SUPPLIED FOR MAKING PIPE ON THE GROUND WHERE REQUIRED.

309 to 317 Market Street, San Francisco.

UNION IRON WORKS,

CORNER FIRST AND MISSION STREETS, - - - - SAN FRANCISCO, CAL.

—MANUFACTURERS OF—

MINING AND MILLING MACHINERY,

Automatic Cut-Off Engines, High-Speed Engines, Hoisting Engines, Quartz Mills,
Manty Chill Mills, Rolls and Concentrating Machinery, Dodd Sigmoidal Water Wheel,
PUMPS--Cornish and Other, Copper and Lead Furnaces, All Classes of Marine Work.

SHIP BUILDERS. ★ BUILDERS OF U. S. WAR SHIPS. ★ HYDRAULIC LIFT DOCK.

NEW YORK OFFICE: 145 BROADWAY. CABLE ADDRESS: "UNION."

MINING, IRON AND WOODWORKING
MACHINERY AND SUPPLIES

INGERSOLL-SERGEANT PISTON INLET AIR COMPRESSORS AND ROCK DRILLS

ENGINES AND BOILERS

PARKE & LACY COMPANY

21 AND 23 FREMONT STREET, SAN FRANCISCO, CAL.

The McGlew Ore Concentrator Company.

PATENTED SEPTEMBER 19, 1893. CHEAPEST, SIMPLEST, MOST DURABLE AND CLOSEST SAVING CONCENTRATOR IN USE. FRANK BARRERE, Secretary and Manager.

Can be seen in operation at the Company's works, 132 Main Street, San Francisco.

Office, 116 Davis Street.

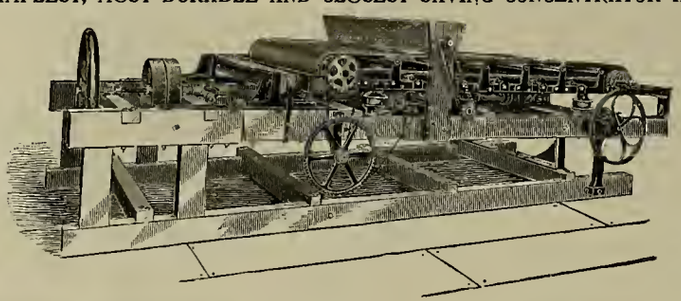
NINETY-FOUR AND ONE-HALF PER CENT
—SAVED—
ON ORES DIFFICULT TO CONCENTRATE.

A MARVEL of Simplicity, Durability and Effectiveness combining both Side and End Motion with a Bumping Belt.

SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1893.

THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully
E. L. BALLOU, Propr. Ballou Reduction Works.



NOTICE TO GOLD MINERS!

SILVER-PLATED AMALGAMATED PLATES
For Saving Gold

IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.

San Francisco Novelty and Plating Works
Incorporated.

SEND FOR CIRCULARS. 68, 70 and 72 First Street, San Francisco, Cal.

Justinian Caire, Agent
521 and 523 Market Street, San Francisco,

—DEALER IN—

Assayers' and Mining Material.

—MANUFACTURER OF—

BATTERY SCREENS AND WIRE CLOTH

—AGENT FOR—

Hoskins' Hydro-Carbon Assay Furnaces.

Rand Drill Co.



Rock Drilling, Air Compressing, Mining and Quarrying

Machinery.

23 Park Place, - - - - New York, U. S. A.

BRANCH OFFICES:

Monadnock Building ..... Chicago
Ishpeming ..... Michigan
1316 Eighteenth Street ..... Denver
Sherbrook P. O. ..... Canada
Apartado 830 ..... City of Mexico

H. D. MORRIS & CO., Agents, 141 First St., San Francisco, Cal.

ADAMANTINE SHOES AND DIES
—AND—
CHROME CAST STEEL
Cams, Tappets, Bosses, Roll Shells and Crusher Plates.



These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

Manufactured by CHROME STEEL WORKS, Brooklyn, N. Y.

H. D. MORRIS & CO., Agents, 141 and 143 First Street, San Francisco.

Special attention given to the purchase of Mine and Mill Supplies.



Stamp Cam.

H. D. MORRIS & CO., DEALERS IN MINING MACHINERY AND SUPPLIES.

141-143 First Street, San Francisco, Cal.

MANHATTAN RUBBER BELTING, PACKING AND HOSE,
SANDERSON DRILL STEEL,
MORRIS CENTRIFUGAL PUMPS,
LIGHT STEEL RAIL.

Market Reports.

The Markets.

SAN FRANCISCO, Oct. 10. 1895.

The appreciation in silver is the feature of the week: from 59⅞ to 68¼ is a most notable advance. A New York dispatch says it is due to silver accumulation at London, preparatory to another issue of honds hy the Chinese Government in settlement of the indemnity to Japan. For months London has heen accumulating silver. The production in the United States has not increased, while that of Mexico has fallen off.

The New York *Financial Record* of the 3rd inst. says: "There has been so much howling against silver that some people have all hut made themselves think it is valueless, hut there is a big, world-wide demand for it that will soon set it starting up toward a dollar an ounce. Silver to-day is the hest and safest investment in the market."

There is a general upward movement in all the metals.

New York Metal Market.

NEW YORK, Oct. 10.—PIG IRON—Southern, 12@14.50; Northern, 12@14.00.

COPPER — Brokers', 12.00c; exchange, 12.25c.

LEAD—Brokers', $3.15; exchange, $3.37½.

TIN—Straits, 14.60@14.65c.

SPELTER—Domestic, $4.20.

New York Silver Prices.

NEW YORK, Oct. 10.—Following are the closing prices for the week:

	Silver in—			
	London.	N. Y.	Copper.	Lead.
Friday	30⅝	67	12 20	.....
Saturday	30⅝	67⅛	12 25	3 25
Monday	30⅜	67⅜	.....	3 30
Tuesday	30⅞	67½	.....	.....
Wednesday	31	67⅝	12 20	3 25
Thursday	31⅛	68¼	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, ⅝ per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.86¼
London Merchants	$4.85½
London Sight Bankers	$4.87¼
Refined Silver, per ounce	68¼c
Mexican Dollars, nominal	55c

San Francisco Metal Market.

COPPER.

Bolt	¼ & 5-16, 20c; ⅜ and larger, 20c		
Lake Superior Sheathing	22	@	—
Ingot, jobbing	—	@	18
Ingot, wholesale	17	@	16
Sheet copper	—	@	21

ZINC.

Sheet	9½	@	

LEAD.

Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* than B, per hag of 25 lbs			$1 20
Drop, B and *larger* sizes, "	"		1 45
Buck, Balls and Chilled, do, "	"		1 45

IRON.

American Soft	16 00	@	18 00
Pig, per ton	18 00	@	20 00

STEEL.

English, lb	16	@	19

ANTIMONY.

Per lb	—	@	10½

PIG TIN.

Per lb	15	@	16 00

QUICKSILVER.

Home trade, per flask	39 00	@	40 —

TIN PLATE.

Per bx	5 25	@	6 00

ZINC.

Sheet	8½	@	

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 50
Greta	7 50
Nanaimo	7 00
Gilman	6 50
Seattle	7 00
Coos Bay	5 50
Cannel	8 50
Egg, hard	13 00
Wallsend	7 50
Scotch Splint	8 00
Brymho	8 00

TO ARRIVE—CARGO LOTS.

Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

COKE.

Gas Companies'			75c ₱ bbl
English, to load	9 00	@	10 00
" spot, in hulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —

NAILS.

Wire	$2 50
Cut	2 25

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, October 10, 1895.

The market hung around the low prices published in last week's issue up to Tuesday afternoon, when there was stronger buying which caused a slight advance along the line. Prices were not only maintained on Wednesday, but still hetter figures reached for shares in the north end, which created a firmer feeling in hoth the middle and Gold Hill groups; even Alta and Bodie showed a slight improvement. There is no denying that during the two weeks' depression there was a weeding out of weak holders, which brought the holdings of commission brokers down to a low point. Not only did margin traders sell, hut quite a number of cash holders let go under the scare produced hy the low prices and the market looking as if it would go to pieces any minute. It is asserted hy those who should koow, that the manipulators gained quite a line of shares; this heing the case, it is only reasonahle to expect higher prices before another hig decline. While at this writing it looks as if shares from one end of the lode to the other will sell at hetter figures, yet it should not create surprise if those in the Gold Hill group of mines scored the highest percentage. This advance will prohahly he led hy Confidence, Challenge and perhaps Yellow Jacket. In the middle shares it looks as if Potosi will he the most active, while in the north end Ophir, Mexican, Union and Sierra Nevada are liahle to show the hest gains. This opinion is hased largely on the way in which the shares in these mines have been handled lately and also on the work that is heing done in them. Of course the manipulations can he changed and also the promising work he turned or else stopped, so that it is hest to he prepared for the uexpected. Until larger moneyed men openly come to the frout and take charge of the market, which they will not do unless there is a very much hetter showing in the mines than is now made public, dealings in shares are not a safe proposition, except for turos. No assessments were levied the past week, hut several are looked for hefore long. The market opened this morning with a fairly firm tone, hut inactive.

News from the Comstock mines is such as to warrant hetter prices, on a gamhling hasis, than now rule, hut for an investment they are fully high enough. The work under way in several may run into quite a hody of ore, which makes them a gamhle; still, results of the past two or more years are not such as to induce investment, buying on a theoretical proposition. In Sierra Nevada, Union, Mexican and Ophir the work is more largely of an exploiting character than for some time past, and it is in the direction where experienced miners look for good results. In Con. Virginia they are opening up quite a hlock of ground ahove the 1100-foot level for exploiting. There are differeot opinions expressed hy mining men as to what will he found. In Best & Belcher and Gould & Curry the work continues to he largely of a dead character, preparatory for more active work later on. In Hale & Norcross they continue to extract each week a few tons of ore while following up several streaks of ore. Savage is milling some accumulated ore. The work in the mine is unimportant. Potosi is milling ore. There was extracted during the past week over 260 tons, assaying a little above $30 a ton. The work in this mine does not attract any more attention than do its shares. Bulliou continues work in the west drift. In Alpha fair progress is heing made in the west drift. It will prohahly take several weeks at the present rate hefore the west lode is struck. The ground in the Cou. Imperial drift is changiug for the hetter. Experienced miners are watching this drift with considerahle interest. They say it will strike the west lode found in Confidence and Challenge. Private advices report that a lateral drift run from the ore found in the Confidence drift, run from the upraise from its surface tunnel level, is in Challenge ground. It is also stated that in striking the lode rich ore was at times struck. No official advices have heen received of this. The Confidence letter states that they extracted 16 tons of ore at that point, and that the drift from the surface tunnel level had heen extended 175 feet, when it passed through old stopes. It also stated that the ore found ahove would he struck ahout 25 feet further west. This shows considerahle of a westward dip of the lode. Evidently the old stopes passed through marks the taking out of ore at some former period, hut which was not reported, or, if reported, was done in such a way as to he misleading. The work in the Yellow Jacket is said to be of an interesting character, hut no official information is allowed to leak out. In Crown Point ore extracting and working to the west are still the order. Belcher and Seg. Belcher are running a joint west drift. In Overman the work is of a procrastinating character. In Alta a slight improvement is reported. Still hetter results are looked for as the work is pushed. From the Bodies the same old stereotyped reports come to hand. If silver continues to advauce, shares in the Tuscarora, Candelaria aud Quijotoa mines ought to come in for more attention.

On the Brunswick lode nearly forty men are engaged in pushing the work preparatory for more active exploiting in the grounds owned hy the Comstock mines. It will take some time after drifting for the ore hefore results can be known. In Occidental the work is largely of an exploiting character. There are those who helieve that something of value will yet he found.

The lowest and highest prices paid on regular call from Oct. 4 to Oct. 9, inclusive, were as follows:

	Lowest.	Highest.
Alta	.....	.....
Alpha	$ 07	$ 09
Andes	38	41
Belcher	48	54
Best & Belcher	89	94
Bodie	29	32
Bullion	13	14
Bulwer	.....	.....
Caledonia	.....	.....
Challenge	66	70
Chollar	52	55
Con. Virginia	2 45	2 60
Con. Imperial	03	.....
Confidence	1 75	1 85
Crown Point	39	42
Exchequer	03	04
Gould & Curry	44	46
Hale & Norcross	1 40	1 45
Justice	05	.....
Kentuck	07	08
Mexican	63	71
Mono	.....	11
Occidental	15	16
Ophir	1 50	1 55
Overman	15	16
Potosi	62	68
Savage	36	38
Seg. Belcher	06	07
Sierra Nevada	83	89
Union	53	62
Utah	07	09
Yellow Jacket	40	45

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alpha Con, Nev	15	10c	Sept 30, Nov 5, Nov 28	C E Elliott, 79 Nevada Block
Alta S M Co, Nev	50	10c	Sept 16, Oct 21, Nov 11	J E Jacobus, 309 Montgomery
Gray Eagle M Co, Cal	41	5c	Sept 23, Oct 28, Nov 22	W J Garnett, 308 Pine
Nevada Queen M Co, Nev	9	5c	Sept 13, Oct 16, Nov 12	Wm. Bowers, 331 Pine
Occidental Con M Co, Nev	20	10c	Oct 1, Nov 14, Nov 25	Alfred K Durbrow, 69 Nevada Block
Seg Belcher, Nev	16	10c	Sept 12, Oct 15, Nov 4	E B Holmes, 309 Montgomery
Savage Mining Co, Nev	87	20c	Sept 20, Oct 23, Nov 12	E B Holmes, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date
Con Cal & Va M Co, Nev	E W Havens, 58 Nevada Block	Oct 21
Eureka Con M Co, Nev	H P Bush, 134 Market	Oct 21

The following illustrates the changes of the week:

Mines.	Oct. 3	Oct. 10
Alpha	$ 07	.....
Alta Cousolidated	08	.....
Andes	38	$ 43
Belcher	48	57
Best & Belcher	95	97
Bodie	.....	.....
Bullion	.....	.....
Challenge	68	74
Chollar	53	54
Confidence	1 75	2 00
Consolidated California and Virginia	2 50	2 65
Consolidated New York	.....	.....
Crown Point	40	.....
Exchequer	.....	03
Gould & Curry	45	50
Hale & Norcross	1 40	.....
Justice	.....	05
Mexican	69	74
Ophir	1 60	.....
Overman	12	.....
Potosi	64	.....
Savage	38	40
Sierra Nevada	87	96
Union	56	68
Utah	.....	.....
Yellow Jacket	40	45

The followiug miuiug compauies reported having had an iudehtedness on October 1st:

Savage	$ 2,056 53	Silver King	$ 4,092 44
Seg Belcher	271 59	Summit	1,169 35

The following is the usual monthly statement of moueys on hand:

BODIE MINES.		Con. New York	$ 1,106 23
Bodie	$19,523 49	Crown Point	7,222 66
Buiwer	430 25	E. Sierra Nev.	32 37
Mouo	338 09	Exchequer	1,092 31
Standard	22,837 57	Gould & Curry	5,993 87
Syudicate	1,007 17	Hale & Nore'ss	3,864 32
WASHOE MINES.		Julia	997 69
Alpha	$ 1,980 10	Justice	2,398 00
Alta	2,353 34	Kentuck	4,677 79
Andes	7,685 07	Lady Wash'n	718 18
Belcher	12,328 93	Mexican	9,863 39
Best & Belcher	7,876 02	Occidental	355 73
Bullion	5,094 00	Ophir	8,912 66
Caledonia	1,840 98	Overman	3,506 84
Challenge	1,719 07	Potosi	19,219 26
Chollar	13,255 62	Scorpion	236 39
Church	12,604 13	Silver Hill	1,136 70
Con. Cal & Va	34,971 69	Sierra Nevada	20,537 54
Confidence	3,539 66	Uniou Con	14,951 95
Con. Imperial	4,668 68	Utah	4,104 53

San Francisco Stock Board Sales.

SAN FRANCISCO, Oct. 10, 1895.

9:30 A. M. SESSION.

700 Andes	43	200 Mexican	72
50 Belcher	55	100 Occidental	16
800 Best & Belcher	96	550 Sierra Nevada	95
500 Challenge	70	650 Union	66
100 Chollar	54	500	68
200 Con Cal & Va	2 65	100	67
500 Gould & Curry	49	200 Yellow Jacket	46
100 Justice	05		

SECOND SESSION—2:30 P. M.

550 Andes	43	300 Exchequer	03
350 Belcher	57	100 Gould & Curry	50
200 Best & Belcher	97	100 Mexican	74
100 Challenge	74	200 Occidental	17
210 C. C. & Va	2 65	100 Savage	40
100 Confidence	2 00	200 Sierra Nevada	96
700 Con. Imperial	03	200 Union	68

Assessment Notice.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the first (1st) day of October, 1895, an assessment (No. 20) of Ten (10c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room No. 69, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fourth (4th) day of November, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on MONDAY, the twenty-fifth (25th) day of November, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada block, No. 309 Montgomery street, San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4,000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

SONORA EXTENDED MINING CORPORATION.—Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

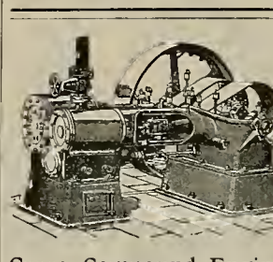
Notice.—There are delinquent upon the following described stock, on account of assessment (No. 3) levied on the 23d day of August, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
R. Risdon	77	1,170	$ 29 25
R. Risdon	100	48	1 20
C. T. Morrison	78	450	11 25
C. T. Morrison	79	450	11 25
C. T. Morrison	101	38	95
C. T. Morrison	504	1,000	25 00
George Strauss	507	3,500	87 50
Jay Deming, Trustee	11	4,000	100 00
E. M. Thompson	111	117	2 92
J. J. Nachtrieb	64	3 385	84 62
J. J. Nachtrieb	99	141	3 52
T. C. Arnold	72	1,890	47 25
T. C. Arnold	109	79	1 97
T. C. Arnold	505	2,000	50 00
G. A. Carter, Trustee	56	3,150	78 75
E. M. Thompson, Trustee	59	1,350	33 75
E. M. Thompson, Trustee	60	1,440	36 00
E. M. Thomdson, Trustee	88	250	6 25
John H. Neale	110	131	3 27
John H. Neale	109	2,000	50 00
L. A. Malson	67	2,660	65 25
L. A. Malson	68	110	2 75
L. A. Malson	107	112	2 80

And in accordance with law, and an order from the Board of Directors, made on the 23d day of August, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, No. 213 Jackson street, San Francisco, California, on MONDAY, the 28th day of October, 1895, at the hour of 3 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.



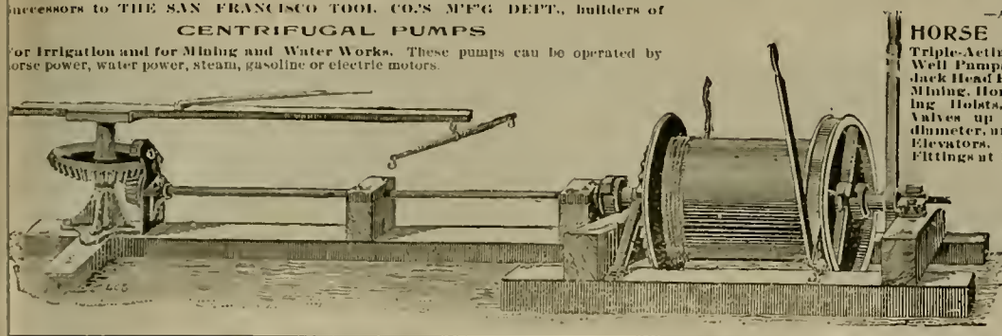

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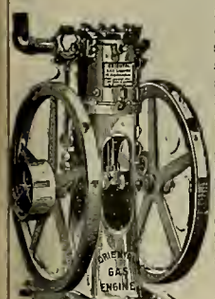
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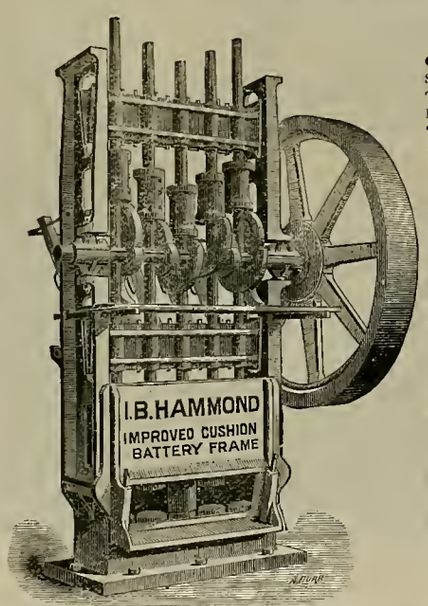
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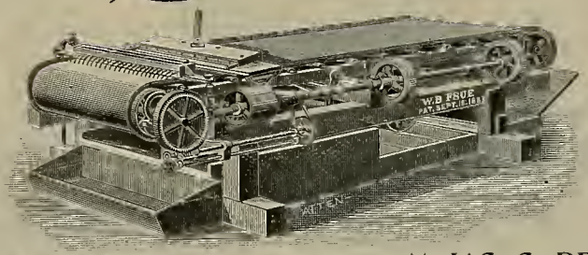
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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 16.

SAN FRANCISCO, SATURDAY, OCTOBER 19, 1895.

THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Compressed Air Locomotives.

Recently was illustrated on this page the newest and best in electric locomotives. Herewith is portrayed the latest in compressed air locomotives. In mine work the steam locomotive is impracticable; danger from fire and sparks, difficulty of disposing of smoke, practically prohibit that form of locomotive in underground workings. While every devised form of application of power or energy has its special field, in the operation of underground workings electricity and compressed air seem to be direct competitors. A brief description of the newest applicant for public favor is therefore of present interest.

The locomotive which is herewith illustrated is now working in the Susquehanna Coal Co.'s No. 6 shaft at Glen Lyon, Pennsylvania. It was built by H. K. Porter & Co., Pittsburg, Pa. Fig. 1 is a side elevation, Fig. 2 a front view, and Fig. 3 a rear view, the dimensions being arranged with a view to the size of the passages in which it operates.

Its most prominent features are the air tanks or receivers, which take the place of the boiler in the ordinary steam locomotive. In this engine the two air tanks are each 29½ inches in diameter, and have an interior capacity of 130 cubic feet. They are cylindrical in form with convex heads. the front head being provided with a manhole. The horizontal seams are treble butt riveted and the heads are double riveted. Each reservoir is tested to carry a regular pressure of 600 pounds to the square inch. The tanks are provided with reducing valves, and there is an auxiliary reservoir from which air is supplied to the cylinders at a pressure of from 100 pounds to 140 pounds as may be desired. The pressure is changeable at will by means of valves.

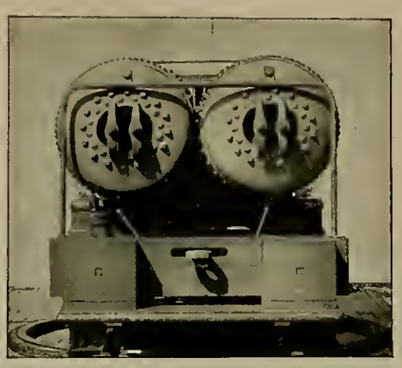


FIG. 2.—FRONT VIEW.

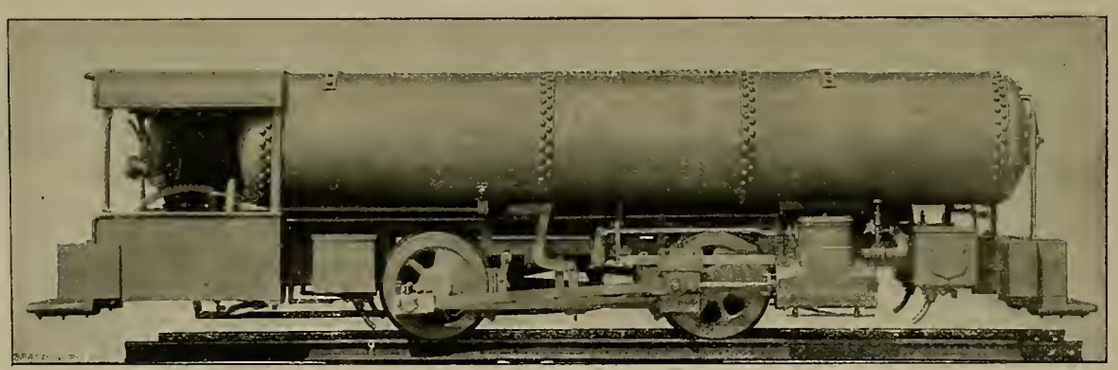


FIG. 1.—SIDE ELEVATION.

From this auxiliary reservoir the air passes into the cylinders, which are 7 inches in diameter and 14-inch stroke. The engine is carried on four wheels or drivers. These wheels are 24 inches in diameter and provided with steel tires. The crossheads, guides, connecting rods, and crank-pins are all made of steel, as are also the axles. The valves are actuated by an ordinary link-pin motion and the links are of steel. The levers, gauges, etc., are placed in easy reach of the engineer and can be controlled by him without moving from his seat. The engine has been planned and arranged to work under the hard conditions necessary in a mine tunnel—moisture, rough track and similar drawbacks and to stand long hours of work with the shortest possible intervals of rest for oiling, cleaning, etc. The engine is fitted with a powerful screw brake, acting upon all the four driving wheels.

The gauge of the mine track in this instance is 36 inches; the length of the engine over all is 17 feet 6¾ inches, its extreme width is 62 inches, and its extreme height above the rail 60 inches. The total weight ready for service is 18,500 pounds. The only machinery required is the air compressor already at work in the mine.



FIG. 3.—REAR VIEW.

In "Concentrates" this week appears an extract from a private letter which indicates what California miners are doing in the New El Dorado—Buluwayo—from where, Mr. Clark writes, was but recently in the heart of a savage country. His letter reads like a fanciful romance, but is rather under than over the truth. That country is the present marvel of the world, and Californians, as usual, are greatly in evidence therein.

About sixteen years ago Supt. McLaughlin put in a telephone on his Eocene ditch in Butte Co. Similar telephones were also put in in other hydraulic mines in Trinity Co. The fact is ancient history, but recent developments in important telephone patent litigation between the American Bell Telephone Co. and the Western Construction Co. indicate that those old California telephones and the date of their installation may play an important part in determining the priority of and just title to valuable patent rights.

The statement "all shares subscribed" in the glowing prospectuses of some of the British South African mining companies is receiving legal inquiry as to its meaning and the liability in case of misstatement on that point. It is probable the common-sense adjudication of the matter will result, as elsewhere, in the principle that where a company advertises "all shares subscribed," and offers those shares for sale, it is to be fairly assumed that purchasers of shares would be buying them from bona fide purchasers, who were responsible under the law for fraud or misrepresentation.

So far no contracts have been secured here for the construction of Japanese battleships. Commander McGiffin, longtime prominent in Oriental naval service, has a different idea of Japan from the popular one. He says Japan "bows and smiles, pats Americans upon the back, thanks them for having led her away from barbarism into civilization, and assures them that she wants to do business with them, while in reality she hates Americans and will buy whatever she has to buy elsewhere than in America." This is probably exaggerated. It seems more likely that the non-securing such contracts is due more to the difference in Oriental and Occidental styles of doing business. With us it is "yes" or "no," "go" or "come," and business is expedited. Our Japanese friends have a thin veneer of Americanism, but under that is the dull bulb of placidity and smiling delay. The "manana" and "poco tiempo" of the Mexican is celerity itself compared with the working of the Japanese business movement. It is not sloth nor inertness: it is just their way, and can only be overcome by patient persistence, "never hasting, never resting." Our German competitors have learned that.

One of the very few journals of the country which received an award at the World's Columbian Exposition was the Mining and Scientific Press. The diploma was for the character of its editorials and the accuracy and reliability of its mining news. The diploma itself has not yet been received, but an official copy signed and approved is in this office.

The retirement for age of Gen. Schofield, Col. Mendell, Prof. Davidson, et al., would indicate that the sure way to insure retention is to be a successful candidate for President, when the age limit would cut no figure.

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J. F. HALLORAN.....General Manager

San Francisco, October 19, 1895.

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FROM every quarter come words of approval, praise and commendation for this paper, which, of course, is very gratifying; for any one and every one likes such things. To publish a part of those pleasant letters would take up too large a portion of our space, bnt they are none the less appreciated and sincerely prized.

PROBABLY nothing better illustrates the present British activity in Sonth African mining shares than the appearance in staid trade journals of age and credit of fnll-page advertisements of sundry speculative schemes. In the current number of *Machinery*, devoted to iron and steel trade, machinery and implements, appears a full-page advertisement of "The Federated Mines Prospecting and Finance Co., Lt'd," capital £250,000, 250,000 shares, payable on the installment plan at £1 each. The prospectus states it is the intention to bny and sell shares in other mining companies. A similar announcement is made of the "Bnlnwayo Consolidated Gold Fields, Lt'd," same capital, shares similarly secnred, same pnrpose. The London mining and financial papers are crammed with similar spread-eagle announcements, but the journal referred to fnrnishes the first observed instance of a conservative technical journal yielding to the pressure.

THE business of prodncing gold is at present nnique in being the most profitable of any commercial or business pnrsuit for these reasons: it is entirely unaffected by overproduction, competition or fluctnation of price, being the only industry of which these things can be said; its relative purchasing power was never higher in the world's history; never before could it be more cheaply produced. These few facts comprise the reason for the present activity in gold mining, and are the reasons for our belief that gold mining in California will be the State's most prominent and paying industry for an indefinite term of years. The best wheat authority in the State has jnst proved in a series of unanswerable articles that wheat growing in California means inevitable bankruptcy; it is a plain fact that in fruit the qnestion in California is no longer how to grow fruit, bnt how to sell it; other fields are overdone and overrun, and in every pursnit bnt that of the miner exists the closest competition. The miner is to-day the best consnmer of the products of the State, the surest pay, the most desirable cnstomer. The logic of this as regards the State is that the commonwealth shonld co-operate in all just efforts for favorable legislation, not as a conclusion or a granted privilege, bnt a duty. As regards general business, it is equally manifest that, as in bygone years, so now; the State's most material prosperity lies in the possession of the world's greatest gold deposits, coupled with the greatest ease of access and most congenial snrronndings.

The Miners' Convention.

The fourth annnal convention of the California Miners' Association was the event of the week. Wheu President Neff rapped with his gavel at 11 last Monday morning the association was represented by 500 delegates in Pioneer Hall, which was decorated with paintings and banners in honor of the occasion. Above the chairman's seat hung a very large painting of a farmer and miner clasping hands; on it were the words: "Prosperity to our country, California; the land of gold, sunshine, fruits and flowers."

Immediately after calling the convention to order, President Neff invited H. Craig, vice-president of the San Francisco Chamber of Commerce, to the platform, who, ou behalf of the citizens and commercial associations of this city, welcomed the delegates, assured them the merchants realized that the local miners were their best customers and spoke in eulogistic phrase of the California miner and what he had done.

A committee ou credentials reported the following named delegates entitled to seats:

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Northwestern Mining Association—W. E. Everette of Tacoma, Wash.

President Neff theu delivered an address as follows:

We have heard it remarked hy some of those who live helow the foothills that the miners have been sending the mountains down into the valleys, hut as I look aronnd over this convention it seems to me that the mountains have come all the way to the hay. Here are men from the snowy peaks and wooded canyons in the great Sierra, hringing with them the fragrance of the pine to mingle with the salt air which sweeps carelessly in over this fair city from the broad Pacific. They come up their shafts and from ont their tunnels, lay aside their rough garb, their picks and shovels, and meet here to discuss the welfare of their chosen industry. The citizens of the metropolis which owes so much to their efforts extend the warm hand of welcome and join with them to give advice and assistance. These are material interests we represent; productive ones, with no fine-spun theories requiring philosophical and abstruse discussion, hut calm practical every-day business judgment. We from the mountains who gather the tiny scattered grains and specks of gold from the ribs of rocks, the channels under the great lava-capped divides, the canyons and gulches of the nills, and the bars of the rivers, each contribnte our mite toward swelling that golden stream which flows day hy day, month by month and year hy year into the channels of trade in the cities. Feehle as may be our individual efforts, yet the result of our combined efforts is to bring to the centers of trade over eleven hundred thousand new dollars in gold every month. And when all the hranches of our work in California are considered we can show a yearly product of the value of twenty millions of dollars. When it is remembered that fourteen millions of this is gold, which is the basis of all value, the life hlood of all trade, we feel that ourselves and our industry are worthy of the moral support which we ask of the citizens of the State. What we bring to you is new wealth, hright and shining from Nature's treasury, not mere figures gained from trading one with another.

Ours is distinctively a productive industry, and the one which was not only the foundation stone on which this favored State was built, hut the keystone of the arch of the completed structure. It may be said without fear of contradiction that for the past two years at least no single industry of California has prospered more or heen more profitable than mining. We who are engaged in it feel proud of this fact, and it enables us moreover to come hefore the other people of the State and ask their aid and support in freeing this great industry from certain features which retard its progress, and in obtaining such legislation and recognition as should double its productiveness. For a long time previous to the inception and organization of this body the mining interests of this State languished. They were neither encouraged hy the people nor hy the laws. A wrong opinion prevailed concerning them. It was supposed California was no longer a mining State, and the miners were left to care for themselves. But when the California Miners' Association was organized and we brought to the attention of the nhlic the true state of affairs and our necessities, our plea was listened to and our cause taken up with earnestness. And I wish here, on hehalf of my hrother miners throughout the State, to express profound gratitude to the merchants and husiness men of San Francisco for the satisfactory and earnest moral support and practical financial aid they have given us from first to last. Without this assistance, so freely and handsomely rendered, we should have failed in our efforts. This fact should he impressed on the memory of every miner in the mountains of California, who should hold in high regard the Board of Trade and the Chamher of Commerce and the individual merchants and manufacturers of San Francisco. What has heen accomplished is familiar to all of you. Possibly we have not gained as much as was hoped for, hut only those who have taken an active part in the administration of our affairs know the difficulties we have had to surmount, and some of which still confront us. When we hegan this agitation there was scarcely a single hydraulic mine operating legally in the drainage hasin of the Sacramento and San Joaquin rivers. Now there are a hnndred, and more heing added daily, all under protection of the law and injuring no other interests. Meantime our gold product is slowly creeping up almost a million dollars a year toward its old standing. While the new law is by no means entirely satisfactory to the miners, yet it is a long step in the right direction, and the fact remains that with it one may mine legally hy hydraulic process, while without it we could not mine at all. It will he part of our duty to obtain further legislation which will remove some of the objectionahle features, at the same time not infringing upon the rights of others.

We have heen represented as desirous of destroying the navigahle streams and the farming lands along their banks, without any consideration of the damages to others caused hy our work. In the older days of the past, when there were no restrictions or necessity for them upon any form of mining, damage of this kind was doubtless done; and some few men cannot be brought to recognize fully the changed conditions. These are of the same class as those few unalterably opposed to hydraulic mining and who desire its absolnte suppression. Notbing is so difficult to overcome as prejudice, but it remains for the people of the State, with calmer judgment, to stand between the extremists and so adjust tbeir differences, that the real benefits may be derived aud the real damages pre-

vented. That this can be done we now know. The main body of the miners of this State recognize clearly that if they pursue this branch of their calling, it must be so done as to inflict no damage whatever. In all this controversy this association has endeavored to pursue a conservative course and an honest one. It has simply asked for justice; and when this beneficent Government more fully understands the question and its conditions, it will doubtless still further aid the miner in his effort to wrest from nature's storehouse those treasures upon which the credit of the nation is established.

Upon this association devolves the duty of bringing the facts before Congress. This matter has by no means been lost sight of by your executive committee, as reports to be read will show. But we must remember that in the many things before us we are representing all classes of miners, and the interests of one must not be neglected by exclusive attention to those of the other. All these affairs can be carried on simultaneously, but it is only during the sessions of Congress that certain of them demand immediate care.

In accordance with the instructions of the Miners' Convention of 1891, considerable time has been devoted during the year to prevent further encroachments on the mineral domain by the railroad companies. The correspondence on this subject will all be laid before you that you may know the details of the steps taken by the special committee having this matter in charge. The position of the association is very simple. It has no fight with the railroad companies other than seeing that justice is done to the mining community. It does not want anything which belongs to them; does not wish to interfere with any of their rights; does not desire to obstruct or hinder them in obtaining title to lands which are properly theirs, or to meddle in any way in the conduct of their affairs. But this association does intend, if it is possible, to prevent these companies obtaining title to any more mineral lands in the State under guise of agricultural land. As you all know, such mineral lands were expressly and in plain language excepted from the grants made to these roads by the Congress of the United States. The railroad companies themselves acknowledge this to be the fact, yet by the iniquitous system which has been carried on for years in the patenting of these lands, hundreds of thousands of acres of the mineral domain have passed from the possession of the Government into the ownership of these corporations. This system is still being pursued, and will be continued unless we have the power to stop it. The heritage of the prospector is passing from him and he seems powerless to stop it without assistance. While, as I have stated, these companies profess to make no claim to the mineral land, yet the fact remains that they have been taking it and are continuing to do so. That it is done under cover of the law and through the proper departments makes it all the more difficult to overthrow the established system. And it is to be noted that notwithstanding these professions of the companies that they want no mineral lands, the mineral claimants are all contested by railroad attorneys before the land offices, and the companies themselves, through their agents, are pursuing an obstructive policy and in every way hindering our efforts to obtain a fair, honest and legal solution of the problem. Our proposition for proper classification of these disputed lands, over which there should be no dispute, are met by specious and procrastinating arguments and counter propositions, which, when analyzed, mean nothing but a determination to outwit us if possible and continue the old course unmolested. And all this in the face of the fact that we only want what the Government reserved for us and declined to give them. We want the lands classified simply that we may know and they may know which is theirs and which is ours, and this is all we ask at their hands.

That these companies will ever consent to any agreement in which the full rights of the miners will be recognized, is doubtful. They will consent to one in which his rights *appear* to be recognized, but when it comes to pin them down to an exact, fair, square agreement, we find it difficult to do so. Meantime, in addition to the obstructive policy mentioned, the officers of the association and the members of the committee are submitted to abuse and misrepresentation at the hands of the subsidized newspapers in the hope of turning public attention from the matter on hand, and disheartening those engaged in carrying out the wishes of the miners of the State.

There is only one of two things for this association to do. It must carry on this fight to a finish or drop it altogether. The mineral lands of California are worth hundreds of millions of dollars, and if we, and the people of the State, through apathy or neglect, permit them to pass into the hands of these corporations, who have no right or title to them whatever, we simply make them a present of so much wealth which belongs to us, and have only ourselves to blame.

It must be confessed, I am sorry to say, that not all of the County Miners' Associations which go to make up this organization fully recognize the importance of our work in this direction. They have not given it the assistance or moral support expected. Some of them, in fact, have even developed a spirit of opposition, possibly through lack of proper knowledge of the matter, or for perhaps other causes which it is not necessary to mention.

But I want to say to the representatives of all these county associations that unless they put their hands in their pockets and furnish their proportion of the funds necessary, we may as well go out of business. There is no use in coming here to San Francisco, meeting in convention, making speeches, passing resolutions, etc., and then going back home and letting the whole matter take care of itself. It needs close and unremitting attention and it needs money. I want you thoroughly to understand that no man in your executive committee, legislative or protection of mineral lands committee, or any other, has received a single cent of compensation for any kind of services whatever. Now remember that, because misrepresentation in this connection has been repeatedly made. No salaries are paid, except a nominal one to the secretary, and he does not draw even that. But we have gone as far as we can without funds. If we have a commission to classify mineral lands the salary and expenses must be paid. If we have matters before Congress, and have to send some one there, he must be paid for his services. We must have money for stationery, typewriting, postage, printing, telegrams and all sorts of miscellaneous expenses. No money is frittered away, but every expenditure is carefully criticised by the committee.

There are gentlemen who have served on some of our committees during the past two or three years, who have performed gratuitously services properly worth thousands of dollars, and even, in view of the magnitude of the interests involved, tens of thousands of dollars. Many of you living at a distance scarcely have any appreciation of the work done, or the time involved in its accomplishment. Some of these gentlemen have received criticism instead of thanks, and I grieve to say, several decline to serve further, asking that others be appointed in their places. As your president, it has come within my province to know the details of work done, and to know the gentlemen who have done it. In fact, they have all performed active service. Your efficient and competent secretary, Mr. Ralston, continues to be as active and energetic as ever, which is all that need to be said. Mr. Sonntag, your treasurer, exercises due care of your funds and actively interests himself in our progress. Mr. Ricketts, as chairman of the committee on protection of mineral lands, has had more work on his shoulders than anybody else this year and has done it intelligently and with effect, and he has been ably seconded by his colleague, Mr. Wright. Mr. Ford, as chairman of the committee on legislation, has had no light task to perform, and we owe him thanks not only for that work, but also for what he has accomplished in one branch of the Legislature, while Mr. Thomas was eloquently doing his share in the other. We all remember Judge Searle's able efforts before Congress, and those of Mr. Cross on various committees. Mr. Thornton has helped us wonderfully in the matter of collection of funds, and others have performed numerous duties requiring intelligence and care, for which they deserve our thanks.

As I have told you, I hope you will not here in convention pass a lot of resolutions and issue a lot of instructions to your officers and committees which will require expenditure of money, and then go off and leave the officers and committees to collect it. You must make more definite arrangement about monthly contributions from members of county associations to maintain this organization. And when you make it, devise also some means of collecting it, and some way of transmitting it regularly to our treasurer, so that the executive committee may be enabled to use it. This is a business feature which demands immediate attention and I commend it to your consideration.

And now, gentlemen of the convention, before we proceed to the business before us, I want to urge upon you all to consider well the course the association is to pursue during the coming year. In preparing your resolutions frame them so that your committees will know exactly what they are to do, and then let them do it in their own way. It is suggested also that your ideas are desired as to the relation of the standing committees with the executive committee. Give us some explicit directions in this, so that we may know the powers of the respective committees. Are the sub-committees to submit their plans to the executive committee or only such matters as involve expenditure of money; or are their actions subject to endorsement by the executive committee? On these matters we want instructions. There is no desire on the part of any one to interfere in the work of any other branch, but the respective powers should be defined to avoid confusion and misunderstanding.

Secretary W. C. Ralston read a report of receipts and disbursements, a summary of which is as follows:

FINANCIAL STATEMENT OF THE CALIFORNIA MINERS' ASSOCIATION FROM NOVEMBER 9TH, '94, TO OCTOBER 15TH, '95.

			Cr.
1894—			
Nov.	9.	Balance in treasury	$1,013 52
	21.	Santa Clara County Miners' Association	20 00
Dec.	4.	Assessment Executive Committee, Yuba County	10 00
	4.	Sale of Badges	22 00
	4.	Sale of Membership Certificates	3 00
	6.	Placer County Miners' Association	100 00
1895—			
Jan	3.	Nevada County Miners' Association	150 00
	7.	John C. and Edward Coleman, San Francisco	100 00
	18.	Church Mine	37 50
	29.	San Francisco Subscriptions	8 00
	31.	San Francisco Subscriptions	4 00
Feb.	20.	San Francisco Subscriptions	2 00
	21.	Placer County	200 00
	28.	Tuolumne County	60 00
Mch.	4.	San Francisco Subscription	1 00
Apr	6.	San Francisco Board of Trade	1,000 00
	6.	Yuba County Miners' Association	55 00
	26.	Placer County (loan)	400 00
	27.	Trinity County Miners' Association	191 00
	8.	Placer County Miners' Association	700 00
May	1.	Santa Clara County Miners' Association (assessment)	25 00
		Sale Membership Certificates (subscription $5 each)	10 00
		San Francisco Subscriptions	2 00
June		Selby Smelting and Lead Company	200 00
		Tuolumne County	80 00
July		Sierra County Miners' Association	10 00
		Grass Valley Miners' Union	115 50
Aug.		Sierra County Miners' Association	72 50
Sept.	10.	Schaw, Ingram, Batcher & Co.	25 00
	13.	Union Oil Company, Santa Paula, Cal.	100 00
	25.	Siskiyou County Miners' Association	25 00
	29.	California Cap Company	25 00
	29.	Ensign, Beckford & Co.	25 00
	29.	Giant Powder Company	50 00
	29.	North Bloomfield Mining Company	100 00
	29.	Risdon Iron Works	50 00
	29.	California Fuse Works	25 00
Oct.	8.	S. W. Harkus	5 00
	8.	George Stone	5 00
	8.	William McDonald	5 00
		Sale of Membership Certificates	3 00

			Dr.	
1894—				
Nov.	21.	Paid J. E. Whitcher (account half tones)	$ 10 00	
		Frame for Diploma	2 50	
		Messengers During Convention	7 50	
		Mineral Land Protests	297 30	
		Office Rent	220 00	
		Printing and Stationery	286 68	
		Representatives to Washington	1,171 50	
		Representatives to Trans-Mississippi Congress	150 00	
		Railroad Map—Mauran	700 35	
		Expense account	474 44	
		Advertising	36 40	
		Expense Convention '94	1 075 05	
1895—				
Oct.	10.	Balance in Treasury	3 79	
		Totals	$5,035 52	$5,035 52

Treasurer Sonntag filed his report, which agreed in every particular with that of the secretary. Both reports were adopted.

It was evident from the start that it was to be a business session; there was no contest over anything nor any intention of one; the sole idea was to do what was to be done quickly and harmoniously, and the work moved with the celerity accorded it by trained parliamentarians. There were men in the convention who long ago had wielded the pick and shovel, and had since graced every department of public life from the Legislature to the Supreme Bench; men who were worth millions worked side by side on the committees with comrade miners who had left the drifts and shafts and hydraulic claims a few days before to come down here in joint deliberation for the common good and mutual welfare of the mining industry.

Tuesday's proceedings began by the reading of the report of the Executive Committee, as follows:

REPORT OF THE EXECUTIVE COMMITTEE.

SAN FRANCISCO, October 15, 1895.

To the Gentlemen of the California Miners' Association in Convention Assembled:—Your Executive Committee has the following report to submit for your consideration:

During the past year your Executive Committee has had nine general meetings, at which reports from the committee on Legislation, Protection of Mineral lands and Ways and Means have been received, which were considered fully and at length.

Most of the work for the past year has fallen upon the shoulders of the Committee on the Protection of Mineral Lands, as that was the paramount question for the time being.

Congress not being in session, the Executive Committee was not called upon to meet and discuss matters so often as it was in the year 1894. Unfortunately, most of the time of this committee has been occupied in trying to devise some means of raising funds.

This committee endeavored in every way in its power to raise money from the County Associations; only one county answered by liberal assistance: certificates of $5 each were printed and sent to various counties, and but few responded.

Assessments were levied on each County Association, in proportion to its membership, as is provided by the By-Laws of the Association, and but few paid that.

The Board of Trade of San Francisco donated $1000 to the Association, without which we would have been unable to continue our work. In fact, the committee was obliged to borrow $400 from the Placer County Miners' Association to defray current and necessary expenses.

This committee found it necessary to send a representative to Washington to place the question of the railroads and the mineral lands before the President of the United States and the Secretary of the Interior. The services of this representative were given without remuneration; only his expenses were paid.

Only $3000 of the $5000 expended in the past year was used in the endeavor to reserve the mineral lands of our State to the prospector and miner.

No officer of the association has received one cent in payment for services rendered during the past year.

This committee cannot continue its labor without some fixed income to depend upon.

The Finance Committee and Committee on Ways and Means have done good work in assisting to raise funds, and to them we wish to extend our thanks.

To the press of San Francisco, and a few interior journals, we are indebted for valuable assistance, and hereby extend to them our thanks.

For a detailed statement of the receipts and disbursements, you are respectfully referred to the reports of the secretary and treasurer.

The secretary omitted to state in his report that there is an indebtedness of some $700, due for the employment of an attorney at Washington, who was engaged to obtain the information regarding the Railroad Land Lists, so that proper protests could be made by the Committee on Protection of Mineral Lands. Respectfully submitted.

W. C. RALSTON, Secretary. J. H. NEFF, President.

The report was ordered filed. Chairman T. L. Ford of the Legislative Committee then read the report of that committee, which will be found on page 252. It was adopted. Chairman A. Carrigan of the Committee on Revision of Constitution and By-laws read those documents as revised, which, with two or three suggested amendments, were voted on and adopted. The amendments make some changes in the amount and manner of payment of dues. As adopted, the annual membership dues for all branches of the association are as follows: Mercantile houses and manufacturing concerns of San Francisco shall pay $50 per annum; mining companies shall pay $25 per annum; all individual members of the associations in counties abutting on San Francisco bay, $5 per annum; in all other counties of the State, mercantile houses, manufacturing concerns and mining companies shall pay $25 per annum and all other members $1 per annum, thus doubling the relative amounts paid by residents of the bay counties.

Dues are to be collected by the county branches, and 75 per cent of the same paid to the secretary of the California Miners' Association, the remaining 25 per cent to be retained by the county branches to pay for the cost of collection of dues and for the maintenance of the branch associations.

The annual dues of the association are to be paid on or before the second Monday of July in each year, and if not paid before the last Monday of September, any member so delinquent to be suspended from the association and his name dropped from the list thereof. Any member so suspended is not to be readmitted to any membership unless he pays up his back dues previous to the time of his suspension; he is not required to pay a new initiation fee.

The Executive Committee may from time to time levy such assessments upon county organizations as the necessities of this association may require. Any county organization delinquent at the time of the annual meeting, on account of any assessments levied prior to ninety days preceding such date, shall only be entitled to representation for members in good standing.

It was further provided for in the by-laws that all persons friendly to the mining interests are eligible to become members of the various branches of this association. In the event that there is no county organization in the county where he resides such person may unite with the State association by forwarding his name to the secretary thereof and paying an initiation fee of $1 and the annual dues as hereinafter provided, and he will be furnished by the secretary with a certificate of membership. But this shall not constitute him a delegate to the meeting of the association. County organizations may admit non-residents as members.

When this matter was finally settled by a unanimous affirmative vote, A. H. Ricketts, chairman of the Committee on the Protection of Mineral Lands, read the report of that committee as follows:

REPORT OF THE COMMITTEE ON PROTECTION OF MINERAL LANDS TO THE ASSOCIATION.

SAN FRANCISCO, October 14, 1895.

To the California Miners' Association—GENTLEMEN: The Committee on the Protection of Mineral Lands of this association has the honor to report as follows:

That the first step taken by it in pursuance of its appointment and the authority vested in it by this association was an attempt to prevail upon Congress to pass an act containing provisions essentially similar to the bill then pending before it regarding the examination and classification of the mineral lands lying within the limits of the grant to the Northern

(*Continued on page 254.*)

Report of Committee on Legislation.

The following report was read and adopted by the convention:

To the President, Officers and Members of the California Miners' Association—GENTLMEN: Your committee on legislation beg leave to report as follows:.

Your committee was appointed at the annual meeting of the association in November of last year (1894), and at once took such steps as lay in its power to carry out the wishes of the association in respect to matters of legislation.

Since the appointment of your committee there has been one short session of Congress, namely, from December to March last, and one session of our State Legislature.

Pursuant to the resolutions adopted by the association at its last meeting, above referred to, your committee drafted two bills for introduction in Congress, but, owing to an entire lack of funds and to the shortness of the congressional session, your committee was wholly unable to secure any legislation at the hands of Congress during its last brief session.

With our State Legislature your committee was more fortunate. Two measures were drafted and presented to the Legislature, both of which successfully passed both houses of the Legislature, and one of which met with executive approval and thus became a law. This latter measure—now a law—provides that when an injunction is granted prior to the trial of a case it shall not continue in force longer than one year, unless the parties consent thereto or the case be set down for trial. The other measure above referred to provided for appeals from judgments and orders of contempt This measure, however, met with an executive veto and thus failed to become a law.

The legislation secured at the last session of the Legislature was without any expense whatever to this association.

Your committee is of opinion that but little more can be done by our State Legislature than has been done, and that the mining industry must look to the National Congress for ultimate relief. In that behalf your committee begs to submit a brief review of the legislation already obtained:

FIRST.—*Legislation Relating to Hydraulic Mining*—Prior to the passage of the law commonly known as the Caminetti act there had been no direct legislation, either State or national, concerning the business of hydraulic mining. The industry in question had never been either condemned or approved by legislative action, and the courts had never gone further than to hold that the business of hydraulic mining might be enjoined whenever the same was so conducted as to become a nuisance within the meaning of the law. The business itself has never been declared to be unlawful. The Supreme Court of this State, in a case appealed from Yuba county, said: "It seems to us it migbt be conceded that the business of hydraulic mining is not, in itself, unlawful, or, necessarily, injurious to others. The unlawful nature of the business results from the manner in which it is carried on, and the neglect of parties engaged therein to properly care for the debris resulting therefrom."

Even in the celebrated Sawyer decision in the North Bloomfield case the court recognized the fact that the owners of the mine in question might provide suitable means to properly care for the debris resultiug from their mining operations, and left the injunction open to future modification or dissolution whenever such means had been provided. In Octnber, 1892, the same court (the United States Circuit Court), sitting in the same case (Judge Gilbert presiding), did modify the injunction and hold that proper restraining works had beeu constructed by the North Bloomfield Mining Company, and permitted the company to resume operations.

Thus it will be seen that prior to the enactment of the Camiuetti law the State and Federal courts both recognized the right of the hydraulic miner to conduct the business of hydraulic mining so long as he could do so without working material injury to other interests, aud this principle has also been incorporated in the statute law of California. The Gilbert decision not only recognized the right of the hydraulic miner to construct restraining works, but held that one of the largest hydraulic mines in the State had actually constructed such works and that they were sufficient to satisfy the law.

There was an attempt made in the Legislature of '87 to invest the business of hydraulic mining with a criminal character, but the attempt failed, and was not renewed prior to the passage of the Caminetti act.

Such was the condition of the law when the Caminetti act became a law iu March, 1893.

Provisions of the Caminetti Law. — The Caminetti act provides that no hydraulic mining (in the territory described in the act) directly or indirectly injurious to the navigable streams shall be carried on otherwise than under the provisions of the act. Any person carrying on such mining otherwise than under the provisions of the act is to be deemed guilty of a misdemeanor, and shall be punished by a fine not exceeding $5000 or imprisonment not exceeding one year, or by both such fine and imprisonment. To gain a permission to conduct the business of hydraulic mining the mine owner must file a petition under oath with a Federal Commission of U. S. Engineers, when notice of hearing the same is given by publication. If, upon inspection, the Commission conclude to grant the request of the petitioner, the Commission are to specify the location and character of the works to be constructed. These works are to be constructed wholly at the expense of the mine owner, and mining shall not be begun uutil such works are completed and approved by the Commission. Such restraiuing works would also take care of the debris resulting from causes other than hydraulic mining.

The Changes in the Law.—1. Under the Caminetti act the miner may coustruct restraining works as before, except that such works shall be constructed under the direction, and subject to the approval, of a Commission of United States Engineers.

2. Criminal proceedings against the miner are permitted in addition to the civil remedies already allowed by law.

3. The miner, upon a compliauce with the requirements of the act, is to be afforded such protectinn as may be given him within the limits of Federal authority.

The act, as originally introduced in Congress, contemplated an appropriation by the Federal Government for the purpose of constructing works for the restraining and impounding of mining and other debris, and further contemplated the use of such works by the owners of hydraulic mines upon the payment by such owners of three per cent of the gross yield from such of their mines as used the works thus constructed by the Government. The act as finally passed, however, did not contain any appropriation for the construction of restraining works, and a proviso was added to section 13 of the act whereby the miue owner was required to construct, wholly at his own expense, the works necessary to enable him to operate his mine under the terms of said act. Thus the privileges to be obtained by the miner under the "three per cent" clause of the act were rendered unavailable both from the lack of an appropriation and the added proviso above noted.

In the meantime the Legislature of California took hold of the subject and passed such measures as lay within the limits of State autbority. The first measure laid down the principle that hydraulic mining might be carried on within the State whenever and wherever tbe same could be carried on without material injury to other interests. The next step was to provide the means necessary to enable the hydraulic miner to to comply with the principle, or condition, thus established. To this end our State Legislature of 1893 appropriated the sum of $250,000 to be used in the construction of works for the restraining and impounding of mining debris, conditioned, however, upon an appropriation by Congress of at least as much for the same purpose.

This legislation was followed by the State Legislature above referred to relating to injunctions, and the attempted legislation relating to appeals from judgments of contempt.

Recapitulation.—It will thus be seen that the legislation thus far has been:

First—An act of Congress, which, in the absence of an appropriation, is of but little practical utility to the hydraulic miner.

Second—Certain State legislation defining hydraulic mining, prescribing the conditions under which it may be carried on, making an appropriation tn aid its rehabilitation, and modifying the law relating to temporary injunctions.

Relief Must Come from Congress.—It will thus be readily seen that we have reached the point where the further efforts of this association must be directed to an appeal to our National Congress.

We herewith present a proposed bill which has already received the endorsement nf the association, and which, while it may leave some undesirable features of the present Congressional act untouched, will, in the opinion of your committee, if enacted into law, place tbe industry of hydraulic mining where its ultimate restoration will be assured.

SECOND.—*Legislation Affecting Mineral Lands*—The sole power to dispose of the public mineral lands of the United States rests in the Federal Government, and all legislation in that behalf must, therefore, be obtained from the National Congress.

Prior to 1866 the mineral lands lying within this State were held and worked under mere possessory titles, based upon local customs and usages. In tbe year last named Congress granted the right of exploration and purchase of the public mineral lands, and laid down certain rules that should govern the possession and acquisition of title of such lands. Tbis law was amplified and re-enacted in 1872, and its provisions, somewhat amended, were afterward carried into the Revised Statutes of the United States, covering Sections 2318 to 2352 of the Revised Statutes.

These provisions, while permitting the miner under certain conditions to obtain the title to his mining ground, were still far short of a complete solution of the difficulties tbat encompassed the mining industry. Time has developed many imperfections in the law that could not have been foreseen at the time of its enactmeut, and especially has this been made apparent in tbe matter of contests betwcen mineral and agricultural claimauts.

In the opinion nf your committee, tbe time is fast approaching, if it has not already arrived, when there should be an entire remodeling of our mining laws, conformable to the necessities and requirements which time and experience have developed.

Pending such legislation, however, your committee would recommend tbe passage of tbe proposed bill herewith submitted, looking to the amendment of certain of the above sections of tbe Revised Statutes of the United States.

This proposed measure, if enacted into law, will bave the effect of transferring from the land offices to the local courts all contests between agricultural and mineral claimants as to the character of the land in controversy, thus bringing such contests nearer home and lessening the expense to the contestants. A certain, safe and just rule would be provided for the determination of the character of such lands, and the miuer al claimant would be relieved of many burdens which are now unjustly imposed upon him. Otber changes will be noted upon an examination of tbe proposed measure.

Conclusion.—In conclusion, your committee beg leave to suggest that, as Congress meets in December uext, it is of the utmost importance that there should be no delay in the needed preparation for the presentation of our case to that honorable body. Our delay has already cost us much and rendered more difficult the work iu band, and if we permit the approaching session of Congress to run its course without having taken some action looking to the relief herein suggested, the cause for which this associatiou has so earnestly labored will have been seriously retarded. Respectfully submitted,

TIREY L. FORD, Cbairman.

Some Legal Points.

No custom is permitted to prevail over the express words of a contract.

In general a suit is to be determined upon the state of case existing when it was instituted.

Where there is a breach of contract, the law fixes the measure of recovery, and whether the breach was accidental, or willful and inteutional is not material.

A person dealing with a general agent, acting within the apparent scope of his authority, is not bound by private or secret instructions from the principal to the agent, not made known, or of which such person has no knowledge.

The rule seems to be well settled that if, at the time of a contract or purchase, the seller knows the buyer has an existing contract of resale, and the object of the purchase is the performauce of that contract, the profits derivable from the resale are recoverable.

On the other hand, when a contract of sale of goods is broken—the price not having been paid in advance—by the failure of the vendor to deliver them according to the terms of the bargain, as a general rule, the measure of damages the purchaser is entitled to recover is the difference between the contract price and the market value of the goods at the time and place of delivery, with interest.

Where one, by fraudulent representations, iuduces another to purchase corporate stock as an iuvestmeut, the loss which the purchaser suffers by retaining the stock under the belief that the representations are true is chargeable against the wrongdoer, such loss beiug presumptively within his contemplation at the time of committing the fraud.

It is entirely competent for debtor and creditor to agree upon a date or a contingency upon the occurrence of which the debt matures and becomes payable, or alternatively upon a date aud a contingency; the date to toll maturity unless the contingency happens before it transpires, and the contingency to mark the time of maturity if it happeus before the alternate day fixed in the contraet.

"The Coming Crash."

TO THE EDITOR:—In England, France and America, for some time, financial savants have been prophesying dire disaster to all who use their resources in a channel not altogether in their own keeping, and as they cannot stay the tide of enterprise and the flow of millions of dollars into South African mining ventures, they stand amazed and call it recklessness beyond all reason. From the Paris letter of the London *Mining Journal, Railroad and Commercial Gazette* I clip the following:

This element of recklessness has given rise to a good deal of concern among timid people, who have long protested violently against the new "craze." The failure of their forecasts nf a collapse, so far, has apparently added rancor to their rhodomontades, and it has necessitated a calm and temperate article from the pen of the eminent economist, M. Paul Leroy-Beaulieu, to cbeck this growing opposition.

The "failure of their forecasts of collapse" arises simply from the fact of their not grasping the backing which has caused the furor for mining shares, hence they stand aghast while the ball rolls on. Let us see what M. Paul Leroy-Beaulieu says, for iu his observations is a pith that will be well for our wise meu to consider:

M. Paul Leroy-Beaulieu points out that undoubtedly a great many investors will suffer in the end, but this is the price that has to be paid for all great financial and commercial movements. The Rand has opened up an enormous field for the active employ of French capital which bas for too long a time lain, like the talent in tbe parable, wrapped up in a napkin. Money is abundant and cheap, and the only way to use it profitably is to boldly risk it. Some of the money will be lost in tbe great channel of speculation, but by far the greater part cannot fail to be extremely productive not only to the investor but also to the country generally. Where the money goes, there follows trade. In point of fact, the gold fever is the salvation of French finance, and this is begiuning to bc understood by French investnrs, who have unbounded confidence in the future of gold mining. The forcing up of prices is certain at some time or other to bring about a reaction, but this must be followed by the placing of the gold-mining industry upon its proper level, when it will once more take up its position as a legitimate investment.

There is, however, a general waiting for the coming crash, and in England and Paris they have beeu prophesying it for the past two years. When the *Mining Journal, Railroad and Commercial Gazette*, some years ago, favored to a limited degree South African investmeuts in mining ventures, it was ceusured to an unjust degree by the commercial journals as lending itself to wild ventures, but time has proved that the *Gazette* was right and the "coming crash" is not yet. Instead, the yield of the mines has expanded aud with this expansion is the outflow of capital into South Africa and elsewhere, and the whirl of speculation is moving onward with it. Some comparison is made to the South Sea bubble and the Panama Canal craze, but in these there is no comparison; on the contrary, there is a marvelous backing to all this speculation. And while experience teaches us on this coast that speculation in mining shares always overrides net returns, yet as respects South Africa the yield has expanded at a ratio to justify the inflation, as inflations go. To my mind the end is not yet, and will not be for years, *provided* the erecting of stamps is maintained at the ratio of the past year, and the prospect is that they will increase.

We must bear in mind that immigration, enterprise and capital are flowing into one of the richest countries of the globe—a virgin continent, we may say, whose gold fields have been explored from Cape Colony to the Lakes, sufficient to know that there could be profitable employment for all the stamps it is possible to erect. They have about 3000 stamps runniug now, producing over $3,000,000 per month in gold, and I would not be surprised if as many more were erected in 1896. The future is beyond any mau's knowledge. A country that has produced some $175,000,000 value in diamonds in the past eight years, and to give full activity to the work could produce $40,000,000 worth per annum, is a wonderful one. Not only is this vast diamond yield a backing for all this mining "craze," as it is termed, but back of this is the product of $141,912,984 of gold, in the past eight years, and which is moving steadily upward. That the reader may grasp this point, and from it be enabled to grasp the possible future of this country, I will detail the yearly product, since mining for gold became active, and as compiled from S. A. journals, as follows:

Year.	*Yield.*
1887	$370,480
1888	3,320,952
1889	5,917,912
1890	7,917,072
1891	11,667,808
1892	19,373,872
1893	23,655,568
1894	32,386,400
1895	37,293,920

The yield they claim will be $50,000,000 for 1895. I do not doubt but it will be $40,000,000. For 1896 it is likely to reach $50,000,000.

Now where is the limit of speculation on such astouuding figures as these, and here we must consider, too, that when it comes to mining, the English are ten times less brash in their ventures than Americans; besides all this, the English are born miners; they are not afraid of investing their capital; they do not depend on surface scratching, as Americans do as a whole, but on depth, and they mine with pounds to our dollars, in any and all ven-

tures, and from this fact comes their greater success. We call the present epidemic a "craze," forgetting our own wild outpourings. To my mind there is a general good in it all. The blood of the business world becomes warmed, and the hidden dollars get into circulation. To be sure, in the general shuffling of treasury some will become wrecked, but in all such financial upheavals the country moves upward and onward. Within my period of business life and experience, I can call to mind various "crazes," where all the wonders and warnings as to the "coming crash" were heralded by the press as is now in regard to South African speculations. I can call to mind the copper "craze" of Lake Superior, of 1846 7-8, yet it opened up, for that period, the greatest copper mines of the world, and made the iron industry of the United States the peer of England. Also California in '49 and '50, which caused 60,000 people in 1850 to traverse 2000 miles of desert, to say nothing of the 40,000 people who came by sea, to reach this golden shore. And what was the result? The State was born in about one year, and $512,000,000 of gold was the product of the first ten years. Nevada in 1860, and the "bonanza" days of the Comstock! All were "crazes," all wrought wealth and ruin, but $400,000,000 of gold and silver was the reward. When we analyze all, we find that when there is a substantial output back of the speculation, more benefit is the result than evil. Our dislike of this furor arises more from jealousy than distrust, and would to God we had a little of it in California, with all its evils. There is more life, wealth and prosperity in a mining epidemic than in all the staid banking, mercantile and commercial business pursuits. Business houses play on the money in circulation, and seven-eighths are the records of failure. Mining furors bring forth new money, more of it, life to every community, and their record of failures is not seven to eight.

Could any mining craze produce more distress in California than exists at present, with about every farm mortgaged for all it will stand, and which at forced sale would not realize 50 cents on the dollar of the general loans upon them? Would San Francisco real estate suffer for lack of buyers, as at present, had we a renewal of "bonanza days" with all its speculations?

San Francisco business to-day can be compared to an old, decrepit miser, chomping a dry crust of bread for sustenance, not desiring to branch out for healthful food, because it takes money from the coffers. Our prosperity will not advance until a change is inaugurated. Our savings banks are simply absorbers of wealth, for making the rich richer, and in their working bring forth but little productive enterprise whereby labor gets employment, as manufacturing institutions.

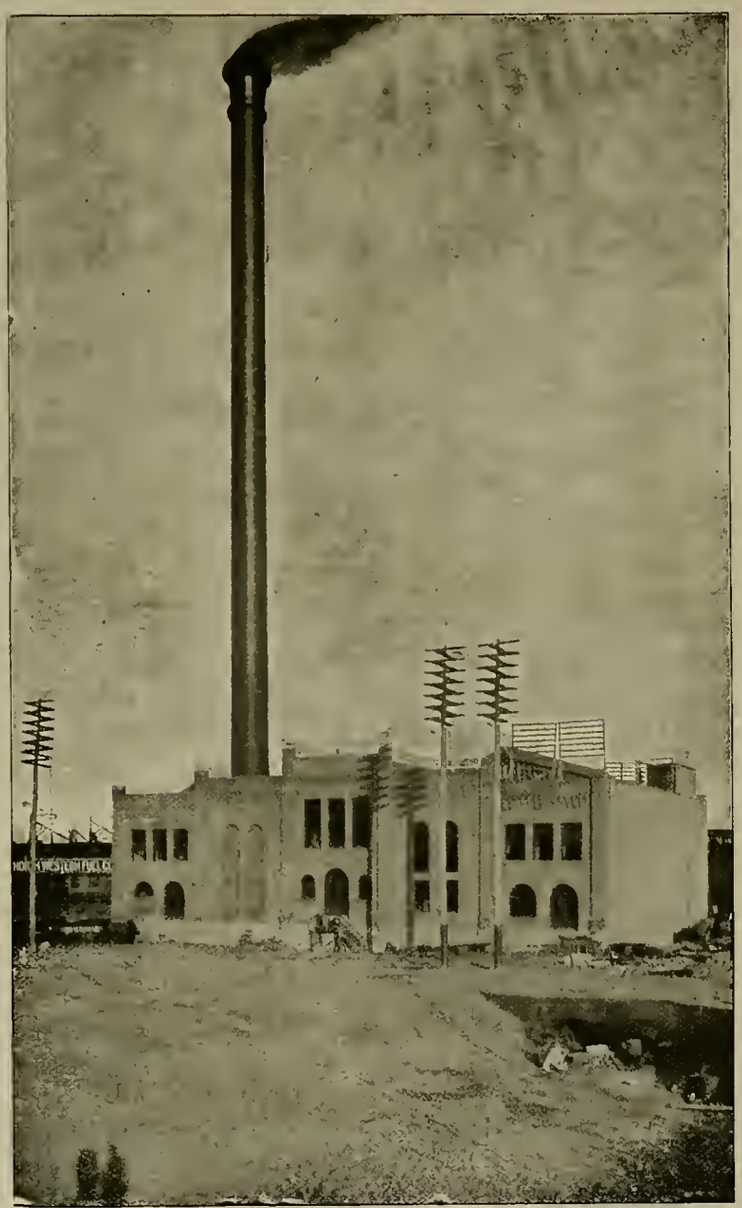
Take all our saving institutions, with their $141,000,000 of deposits—what industry do they maintain? Our city savings banks, with their $110,000,000 of deposits loaned on San Francisco real estate—they loan for interest, and interest has eaten it about all up and forced sales to pay this interest, has caused the market to suffer, and this state of things has caused distress in all branches of trade, and there will be no relief until we reach out and bring more money into circulation—more new money. Would we not consider the European-South African craze a Godsend, with its $40,000,000 more new money every year? Did we have it, would not a new condition of things be inaugurated, and would not the good far outstrip the evil? And here we are in a State ribbed with veins carrying the precious metals in abundance, and are not possessed with snap enough to embrace the advantages before us. As far as this European mining craze goes, all I dislike about it is that it puts California in the background in the eyes of European investors, and forces us to rely on our own mining capital, and as a result there must be a decline in the value of our gold properties. If the American people would show the mining spirit of the English, and not be so fearful of the loss of a few dollars, a very great good would be the result, as then the production of our mines—all the new money—would be kept at home, and the native born would have some show for labor. Let us hope that the South African "craze" will continue to expand; that the blood of the business world may get warmed up, and that California—and every other of our mining States—may be favored with a "coming crash."

ALMARIN B. PAUL, M. E.

San Francisco, Cal., Oct. 15, 1895.

Steel Chimneys.

Steel chimneys are attracting considerable present attention. It is claimed that they can well withstand destructive forces from within and without. On this subject a mechanical engineer says: It is surprising that a chimney constructed of so many pieces of burnt clay, laid together in a mortar that of itself has no tenacity whatever (the mortar of a brick chimney which has been heated and cooled a few times) should be preferred to a casing of steel and having a tensile strength of 60,000 pounds per square inch, securely riveted together and then solidly bolted through to the bottom of the foundation, and so stable indeed, that if pulled upon from the top it would upset from the very bottom of the foundation before it would noticeably bend through the length of the long shaft. The ordinary brick stack has to be considered as having a possible failing point at every joint, and should be calculated in its successive steps of thicker to thinner walls to determine the point of least stability.



A STEEL CHIMNEY.

In "Rankine's Applied Mechanics" the stability of a 455½-foot stack in Scotland is given, which shows the stack to have a resisting strength only four pounds above the highest registered wind pressure in that locality. Some parts of the stack were stronger, but as a whole it was to be relied upon to stand only to the limit of strength of its weakest part.

The stack illustrated was built by the Philadelphia Engineering Works, Ltd., of Philadelphia, Pa., for the Hartman General Electric Co., of Duluth, Minn. It is 7½ feet in diameter and 200 feet high. The General Electric Company of Cleveland has such a chimney 226 feet high, and, from an engineering standpoint, is in every way satisfactory.

Reasonable Geology.

By FREDERICK DANVERS POWER, F. G. S.

Man is a reasoning being, and applies his reason to elucidate obscure things. Sciences owe their existence to logic, without which they would be a mere jumble of observed facts gathered together haphazard. There is no science that requires the assistance of man's reasoning power more than geology, the practical outcome of which is mining; and yet, since the death of alchemy, there are, perhaps, few sciences in connection with which we hear such crude and absurd arguments. I do not refer to the trained scientist, who has done as good work in connection with the comparatively new science of geology as he has in connection with allied subjects, but to the pseudo-scientist, who allows his imagination to run riot with the one or two facts he possesses, till even he is unable to distinguish fact from fiction. Such ill-formed people, judging a whole by the few bits of badly digested knowledge they possess, do incalculable harm by promulgating false ideas, and bring ridicule to the subject of which they constitute themselves champions. Every miner, notwithstanding his frequently avowed objection to theory, attempts to form one, when confronted with unusual phenomena, as soon as he has two ideas to put together. Frequently they put the cart before the horse, and begin to theorize before they have collected the necessary data for their work; and as this data comes to hand, they endeavor to make it fit their views rather than make their theory fit the facts. There are others again who, from an inherent desire to prove that things are not what they seem and have been accepted to be for generations, attempt to throw doubt on the simplest phenomena, thereby obscuring rather than throwing light on the subject. Some people seem to think that we have come to the end of all knowledge; that they know everything which is worth knowing; and that any information others possess which they have not is of no value. This tends to cast discredit on learning and to discourage enlightened investigation. Statements are often made that have no foundation in fact, and these are handed down from one to another, each adding to or subtracting from the original story to suit his individual taste, till at last some purely fanciful description of a phenomenon, which possibly being past cannot be checked by later observations, finds its way into print for *savants* to puzzle their brains over in the future and to reconcile with modern views as well as they can.

The origin of an ore deposit has a direct bearing on its probable permanency and richness. It will thus be seen that it is highly important to the miner that he should know the true cause of his lode and the source of the ore, not only to assist him in developing the deposit, but also in searching for similar ores.

Much misunderstanding has been caused by the improper use of words. An illiterate person hears a technical expression, and thinks he will raise himself in the estimation of his fellows by using the same, which he takes the first opportunity of doing, in many cases placing the wrong construction on it. Maybe his mates catch at the word as being quaint, and perpetuate its false meaning until in time the new interpretation is generally accepted, owing to its common usage, and then we have one more opportunity of confounding different ideas that are expressed by the same word. A word with two distinct meanings is really two words. An apparently genuine but really illogical argument is often caused by the use of ambiguous terms, which possess different meanings in different localities—for instance, "black jack" may mean zinc blende, cassiterite, tourmaline, menacinite, chromite or almost any blackish mineral the miner is unable to supply with its proper specific name. To a mineralogist the term "black jack" simply implies that the substance belongs to a number of bodies that possess one property in common, viz., blackness, and that property may happen to be an accidental and not a characteristic one, for cassiterite may be black, brown, red or gray; tourmaline can be black, green, red, etc. But if the special name of the mineral referred to under the general term "black jack" was mentioned, then by the utterance of that word alone the mineralogist would understand not only the colors peculiar to it, but its chemical composition, physical properties, value, etc. The miner understands by the term "black jack" that mineral which is so designated in his own locality; and should some other be intended, then useless disputes are apt to arise, which would be avoided by employing less general words.

(To be Continued.)

The Miners' Convention.

(Continued from page 251.)

Pacific Railroad Company in the States of Idaho and Montana. This bill H. R. 8551 was introduced in the House of Representatives by Mr. Congressman Caminetti, a copy of which is marked Exhibit A and made a part hereof. It being found impossible to successfully prosecute this matter to a conclusion at that session of Congress, it was finally concluded before the close thereof, to introduce a bill H. R. 8963, to add a new section to what is now known as the "Idaho-Montana Act," approved February 26, 1895, to be known as section 9 of that act, making all the provisions of that act applicable as far as possible to the State of California. This bill also failed of passage. A copy thereof is made a part hereof and marked Exhibit B.

The expense attending these proceedings was about $625.

During the pendency of these proceedings the committee employed Mr. J. R. Moran, a competent engineer, to prepare for it a map of the State of California, showing the relative position of the railroad grants and the probable boundaries of the mineral belts. This map contains much data bearing upon this subject never before collected. The cost of this map is $700.36.

This committee, finding that all efforts to secure Congressional action touching the preservation of the mineral lands of this State were unavailing, made preparations to file protests against all railroad lists of selections, as they would from time to time appear in the several newspapers of the State under the provisions of the rules and regulations of the Department of the Interior, dated July 9, 1894. In consequence of the vague and indefinite form of the advertisements which appear in that regard, it is impossible to gather therefrom a knowledge of the exact number of acres involved in the protests which have been filed in behalf of, and as the work of, this association by Messrs. Edward H. Benjamin and William C. Ralston, but this committee has positive knowledge that at least six hundred thousand acres are involved, and it believes that the aggregate acreage will amount to somewhere in the neighborhood of one million acres. As these protests are substantially similar in all respects, a copy of only one thereof is made a part hereof, and marked Exhibit C.

The expense attending these proceedings is about $300.

Protests involving nearly six hundred thousand acres, filed in the name of Edward H. Benjamin, have been dismissed by the Commissioner of the General Land Office on the ground that the character of each forty-acre subdivision included therein was not specifically shown. Appeals from these orders of dismissal were taken in due time to the Secretary of the Interior, allowed, and are now pending before him, all briefs on both sides being now in; but unless these cases are expedited or advanced upon the calendar of the Secretary's office, they will not be determined for, say, something like eighteen months or two years from this time. A copy of appellant's opening brief, a copy of the answer of the appellees, and a copy of the appellant's reply, are made a part hereof and marked respectively Exhibits D, E and F.

It is perhaps proper in this connection to state that the chairman of this committee was appointed by the Executive Committee in the latter part of March, 1895, to proceed to Washington, and take such steps as he might see fit, either in the Department of the Interior, or before the President of the United States, touching these matters. The matter was finally laid before the President of the United States directly, both by oral and printed argument, to the latter being attached a photographic copy of the map of this State, made by said Moran. A copy of said printed argument and a photographic copy of said map are made part hereof, marked respectively Exhibits F-1 and F-2. At that time the President of the United States personally assured your said representative that he would take due action in the matter, and to that promise may be attributed the present status of what are commonly called the "Benjamin Appeals," it having been hitherto contrary to the practice of the Department of the Interior to grant appeals to a protestant, particularly from an order denying a hearing such as made in those cases.

The expense attending this trip was about $1650.

At the suggestion and by the request of the Executive Committee of this association, this committee also caused the printing, under its supervision, of what is commonly known as "An Appeal to the Miners of California," containing some forty-five pages of printed matter, which clearly set forth from official documents and other sources the status of the mineral lands, and the necessity for pecuniary aid from those interested in the subject, a copy of which said pamphlet is made a part hereof and marked Exhibit G.

Five thousand copies of this pamphlet cost $120.

Also, at the suggestion and by the request of the said Executive Committee, "An Appeal to the People of California" was also printed, a copy of which is made a part hereof and marked Exhibit H.

Five thousand copies of this pamphlet cost $7.50.

Also, at the suggestion and by the request of the said Executive Committee, this committee prepared and caused to be printed, under its supervision, a circular addressed to the miners of California, calling their attention to the necessity and propriety of filing individual protests against railroad selections, a copy of which said circular is made a part hereof and market Exhibit I.

There is also made a part hereof a copy of the form of protest, prepared and printed under the supervision of this committee, and referred to said circular Exhibit I, and which is marked Exhibit J.

The expense connected with this matter amounts to $297.30.

That since the 20th day of August, 1895, there have been certain negotiations pending between this committee and W. H. Mills Esq., as land agent of the Central Pacific Railroad Company, touching an amicable adjustment of the questions which have arisen between this association and the land-grant aided railroads in this State in the matter of the examination and classification of the lands lying within the limits of their respective grants. A copy of the correspondence connected therewith may be found as a part of appellant's reply, Exhibit F. It will be noted therein that there is nothing to restrict either side to the proposed agreement from applying to Congress for appropriate legislation in the matter.

Mr. Edward H. Benjamin was appointed the commissioner to act for the association, provided that said agreement was consummated, and his selection for that position was thereafter approved by the Executive Committee of this association at its meeting on the 7th inst., with the restriction that he take no part in the classification and examination of such lands as may be embraced within the several protests filed by him in behalf of this association. Respectfully submitted,

A. H. RICKETTS, Chairman.
J. M. WRIGHT.
CHAS. G. YALE.
E. C. LOFTUS.
CHAS. H. HOFFMAN.

(The documents referred to in the above report have already received extended notice in these columns.) The report as read was adopted without discussion. Subsequently, by request, Mr. Ricketts read the last letter received, on the 11th inst., from Mr. W. H. Mills, relative to the proposed compromise, which had been received too late to be embodied in the report.

The hour—2 P. M.—having arrived, at which time it had been agreed upon to elect officers, A. Ames of Placer placed in nomination the present incumbent, Hon. J. H. Neff of Placer, who for the fourth time was the unanimous choice of the association for its president. Hon. Niles Searls nominated S. K. Thornton of San Francisco, the present vice-president, to succeed himself; he also was elected by acclamation. For secretary, Hon. C. W. Cross placed in nomination Julian Sonntag of San Francisco; C. Runckel of Placer nominated W. C. Ralston.

Mr. Ralston asked leave to make a few remarks and said:

As the question of my candidacy for the secretaryship of the Miners' Association for the coming year has received rather an undue prominence in the newspapers, some explanation of my position is due my friends. I have served as secretary of this association and the Executive Committee since its organization to the best of my ability, and a few months since concluded to retire from the position and give more time to my private affairs, thinking also that some new blood among the officers would be beneficial to the association. While in New York last month, I wrote to some of my friends that I would not be a candidate this year and so expressed myself upon my return to all who cared to know. My very good friend, our worthy president, had also announced his intention of retiring from his position. Quite recently very strong pressure was brought to bear upon Mr. Neff to reconsider his determination. It was found, however, that such active and intelligent workers on the committees as Messrs. Ricketts, Wright, Ford, Loftus, Yale and others also declined to serve in their respective positions again. Mr. Neff positively refused to let his name be used unless those whose loyalty to the association and the miners' cause had been proved to his satisfaction would continue to serve with him. There were rumors that the railroad companies intended to capture this association if possible, and a certain opposition to the course of the association was developed even among members of the Executive Committee itself, mainly, however, from a few who never attend its meetings or pay the slightest personal attention to its proceedings, except when they may serve some purpose of their own by so doing.

I was only one of those who were urged by Mr. Neff to continue with the work. At his urgent personal solicitation, and against my will, I promised him I would again become a candidate for the secretaryship. The only reasons why I did this were to please him and because I knew, as you all do, that no other man would make so good a president as he and that he would not serve unless we would also. It was for what he considered the good of the association that I, among others desirous of retiring, consented.

In the mean time, other gentlemen perfectly competent to fill the position, and actively interested in the association's affairs, had announced themselves as candidates, and I was placed in the unpleasant position of trying to continue in an office I did not want and keeping out others who might fulfill its duties better. It was only yesterday that Mr. Neff absolved me from my obligation to him and left me free to act as I desire. It is, therefore, with great pleasure that I can announce to my friends who may have intended to compliment me by their votes that I decline to be a candidate. I have this to say, however—that, while I shall no longer be an officer, my active interest in the affairs of the Miners' Association will by no means cease, and I shall endeavor in every way, as far as I can, to assist it. And I hope that the associations of my successor with the officers and committees will be as pleasant as mine have been within the past four years.

The remarks of all the speakers were applauded. As in the cases of President Neff and Vice-President Thornton, Mr. Julian Sonntag of this city was unanimously elected secretary of the association by acclamation for the ensuing year. For treasurer, Mr. R. Church of San Francisco nominated Mr. W. W. Montague, that gentleman receiving the same compliment as the others in a unanimous viva voce vote. The recipients of these honors each made a brief, sensible speech.

R. M. Clarken of Sacramento, chairman of the Committee on Resolutions, then read that committee's report, as follows:

REPORT OF THE COMMITTEE ON RESOLUTIONS.

MR. PRESIDENT: Your Committee on Resolutions have the honor to report as follows:

HYDRAULIC MINING.—*Whereas*, The injustice done to a great branch of the mining industry of this State, whereby thousands of people were ruined and millions of dollars' worth of property destroyed, still continue to exist, in spite of every effort made to bring them relief without injury to others, therefore be it

Resolved, That we believe that it was through one branch of the Federal Government that the hydraulic mining industry was prostrated and destroyed, so must it be through another branch of that Government that relief must speedily come.

Resolved, That this association urge and request our Senators and Representatives in Congress to use every effort to secure an appropriation so that, aided by the appropriation made by the State of California for the building of dams as recommended by the Congressional Commission, this great industry be revived without injury to the navigable streams if the State or to the farming lands adjoining.

Resolved, That we endorse the action of the California Debris Commission, believing that it is fair and impartial, and we also urge upon our Senators and Representatives to secure such an appropriation as will be necessary to carry out its work.

MINERAL LANDS.—*Resolved*, That we heartily endorse the efforts of this association's Committee for the Protection of Mineral Lands to maintain, free and open for exploration and purchase by the prospector and miner, the mineral lands of the State of California, and that a committee of like character be appointed by the president of this association, to continue the prosecution of the same work until Congress shall have passed some law for the classification of the railroad grant lands in this State, and that the work of said committee shall apply to all the railroad land grants within the State of California.

Resolved, That the Committee on Legislation, when appointed, be instructed to use all honorable means at its disposal to secure such congressional legislation as will provide a just and speedy settlement of the so-called mineral lands controversy now pending between this association and the railroad companies having congressional land grants within this State.

Resolved, That in contests between mineral and non-mineral claimants of land it is the sense of this convention that jurisdiction should be conferred on the local courts by Congress to determine the character of the land in controversy.

GENERAL RESOLUTIONS.—*Resolved*, That the thanks of this convention be extended to the press of San Francisco and this State for their earnest co-operation in making this convention a success.

Resolved, That the miners of California gratefully acknowledge the valuable assistance rendered to this association by the Board of Trade, Chamber of Commerce, and other organizations of San Francisco, for their strong, liberal and financial support, which has largely advanced the mining industry of California.

Resolved, That all committees of the California Miners' Association, report to the Executive Committee thereof all proposed action of said committees before finally acting thereon, unless otherwise authorized by the general convention, and that no act of any subordinate committee shall be considered as the action of the California Miners' Association until approved or authorized by the Executive Committee thereof.

Resolved, That until the next meeting of this association the Executive Committee shall have plenary powers to originate and decide upon all matters pertaining to the affairs of this association not in conflict with the express direction of the association in convention assembled.

Resolved, That this convention calls upon the various mining counties of the State to sustain a watchfulness over the investigations before the District Land Offices of their respective sections, and that they be requested to take such steps as shall prevent the railroad companies from procuring patents to mineral lands.

Resolved, That the thanks of the convention be extended to the Legislative and Mineral Land Committees, for their faithful performance of an arduous duty, and which needs such a continuance of the same intelligent activity to accomplish the end for which the miner is contending, the preservation of the mineral lands for the miner.

Respectfully submitted, R. M. CLARKEN, Chairman.

The report was adopted as read, following which E. H. Benjamin made report regarding his representation of the association at the Trans-Mississippi Congress.

The harmony and general good feeling that had prevailed during the first and second days of the convention's proceedings continued unbroken to the close. On Wednesday morning there was a diminished attendance, press of private business having summoned some of the delegates to their homes. President Neff announced the appointment of the following committees:

Executive Committee, At Large—W. W. Montague, C. W. Cross, H. Pichoir, T. R. Church, A. Carrigan, L. Sloss Jr., S. B. Christy, R. McMurray, E. Coleman, J. M. Wright, T. J. Parsons, D. E. Hayes, S. J. Hendy, T. L. Ford, R. E. Browne.

Additional by counties:

Alameda—A. H. Ricketts, C. G. Yale.
Amador—J. F. Parks, J. R. Tregloan.
Butte—A. Ekman, W. E. Duncan.
Calaveras—T. T. Lane, F. F. Thomas.
El Dorado—J. J. Crawford, J. Richards.
Mariposa—A. Wartenweiler, T. Couch.
Nevada—F. Zeitler, J. M. Walling.
Placer—H. T. Power, F. Chappellet.
Plumas—G. Standard, W. W. Kellogg.
Sacramento—J. Batcher, J. H. Burnham.
San Francisco—E. A. Belcher, W. C. Ralston.
Shasta—R. G. Hart, C. W. Fielding.
Sierra—F. R. Wehe, D. T. Cole.
Santa Clara—R. R. Bulmore, C. C. Derby.
Siskiyou—A. G. Myers, J. Farraher.
Trinity—J. McMurry, D. G. Reid.
Tuolumne—E. C. Loftus, J. W. C. Maxwell.
Ventura—J. B. Treadwell.
Yuba—J. O'Brien, L. Courath.

Committee on Legislation—T. L. Ford, J. M. Wright, E. A. Belcher, A. H. Ricketts, J. McMurry, G. I. Taggart, R. E. Browne, W. W. Kellogg, C. F. Hoffman, R. McMurray, D. G. Reid, F. R. Wehe, H. Craig, T. J. Parsons, E. Coleman.

Committee on Preservation of Mineral Lands—W. C. Ralston, A. Carrigan, C. F. Hoffman, E. C. Loftus, W. R. Thomas.

Some vigorous addresses were made, among others by Congressman Magnire, who said:

I have always been in full sympathy with your purposes from the beginning. I have at all times endeavored, as far as my ability and knowledge allowed, to aid you and your representatives in securing and promoting justice for you.

The great question now absorbing the people of the mining districts is the effort to prevent the Central Pacific Railroad Company and its successors from obtaining possession of the mining lands of the State under a grant which did not include mineral lands.

Whatever I can do to prevent the carrying out of this plan by the railroad I shall be pleased to do on every occasion and at every opportunity when in Washington or here. If I can serve you here in the accomplishment of that purpose and prevent the injustice which I believe is now being put on the mining people, you may call on me, and you may rest assured that I will do whatever I can to aid you and your cause. I want you to feel that you may freely call on me to protect your interests, for on this particular matter my mind is fully made up and my course settled.

W. W. Kellogg of Plumas submitted the following resolution:

Resolved, That it should be the policy, as it is the duty, of the General Government to preserve and protect the mineral lands belonging to the Government from being patented or conveyed to railroad or other similar corporations; that such lands should always be open for prospecting, working and developing, and by individual companies or corporations organized for mining purposes alone, and that when a contest to an application for grants of land by the Government to said railroad companies arises as to the character—mineral, agricultural or timber—of such lands, the General Government should, as a matter of right and justice and for the benefit of the country and citizens generally, pay all the expenses incurred before any of the departments.

The resolution was adopted as read.

Railroad Commissioner La Rue, a delegate from Sacramento, said:

I am with you in this fight against the great corporation that has throttled the people of this State in all directions. I believe that all mining lands should be as free now as they were in 1849. The railroad should be curbed. God knows, they have enough. I am engaged in a similar fight to yours. It is not, however, a fight against the railroad as it is for the people of the State.

In a happily worded speech President Neff presented ex-Secretary Ralston with a handsome token

of the esteem in which he was held by the association in the shape of a solid silver table set—a magnificent gift—which was accepted and responded to in graceful phrase by the recipient amid applause.

A. Carrigan, L. Sloss, Jr., and T. J. Parsons were appointed members of the Auditing and Finance Committee.

W C. Ralston offered the following, which was unanimously adopted:

WHEREAS, Charles G. Yale was the founder of the California Miners' Association; as now constituted, and whereas he has rendered invaluable services to the association at all times since its organization as an editor, earnestly and intelligently urging measures for its advancement, as a writer for the daily press fearlessly and consistently making its contests, and as a diligent worker upon its various committees; therefore

Resolved, That the gratitude of the California miners is due to Charles G. Yale for his past services, and that its thanks be hereby tendered to him; and

Resolved, That the secretary of this association be and he is hereby directed to furnish the said Charles G. Yale with an engrossed copy of these resolutions, the same to be duly attested by the signatures of the president and secretary of the association and by the impression of its seal.

President Neff then made a brief but impressive address, congratulating the association on the harmonious and successful termination of the convention and again directing the attention of the several county organizations to the need of constant zeal in the advancement of the interests of the State association and the procurement of necessary funds to enable the central organization to carry on the work. The delegates gave three hearty cheers for their chairman and the convention of '95 adjourned to meet next year or at the call of the Executive Committee.

Concentrates.

ARIZONA papers report the sale of the Congress mine.

THE present New York quotation for platinum is $12 per ounce.

THE office of the Union Iron Works has been removed to 222 Market St.

NEARLY $25,000 was distributed among Nevada City working miners last Saturday.

WITH copper at 12¼ cents, it looks as though the old Union mine at Copperopolis could be made a paying producer.

DURING 1894 the United States produced $6,829,260 more gold than silver, taking silver at its commercial valuation.

THE Boston mine, twenty-five miles northeast of Visalia, is being reopened by Visalia men, who have bonded the property.

THE *Inter-Mountain* says every time copper goes up a cent a pound Butte receives the benefit to the extent of $2,000,000 a year.

THE Gwin mine shaft is now down 1030 feet, the station has been put in and preparations are being made to start the 1000-foot level.

SEPT. JUTTON will add ten stamps to the 10-stamp mill now running at the Pine Log mine, operated by the Royal Mining Co., near Copperopolis.

R. C. WALRATH and Col. Stone have control of the old Flag mine, twelve miles from Marysville, will put on powerful pumps and operate the property.

TO DATE the par value of South African gold mining investments aggregates about £50,000,000: the selling price is nearly one billion dollars—an enormous bladder.

THE Omaha & Grant Smelting Co. have bonded the Ruby Silver, Slocan, B. C., for $7500, and the Ajax and Treasure Vault claims, situated near the Noble Five.

ONE HUNDRED MEN are now busy building the smelter at the Silver King mine, B. C. E. I. Parsons, of this city, is superintending the building of the tramway.

THE result of the recent clean-up at the Harmony mine, Nevada county, was a bar of bullion worth $10,000, the product of a run of twenty-four days, $7000 of which is profit.

ELEVEN gold claims in the Big Bug, Arizona, district have been bonded for $50,000 by J. E. Ralston of Chicago, who will put up considerable machinery, including a 10-stamp mill.

THE Secretary of Mines for the colony of Victoria reports that the gold production of that colony in '94 was 673,680 ounces—an increase of 2554 ounces over the output of '93.

RIEHL, MONTCURE AND GILLETT, Palermo, Cal., have tunnelled 250 feet on a promising ledge, are sinking a shaft, and believe the prospect justifies the purchase of a 5-stamp mill.

GOLD is becoming an important staple of British Guiana. From 250 ounces in 1884 the production has increased to 138,000 ounces. It is obtained at present chiefly by placer mining.

"TIME CHECKS" are making trouble at the Trail, B. C., Reduction Works. Time checks and the resultant scalping nearly always make trouble between employers and employed.

THE *Australian Mining Standard*, published at Sydney, one of our most valued exchanges, has been purchased by Mr. F. Critchley Parker, who will hereafter issue an illustrated journal.

CANE & GRAYSON, of Stockton, have bought the Carlyle mine on the south fork of the Feather, near Forbestown, will build a wagon road from Enterprise, and put machinery on their property.

BY good management and close economy, the quicksilver mining companies are enabled to pay monthly dividends. The recent fluctuations in the price have resulted in a present quotation of $40 per flask.

LAST week in Spokane, Wash., the Cedar Canyon Mining Company, capital $200,000, incorporators, W. A. Crawford, J. A. Cameron, I. L. Vanhorn, and the Homestake Consolidated Mining Company, capital $500,000, incorporators, W. L. Blossom, F. E. Elmendorf, C. N. Cheney and A. Townsend, incorporated.

THE Redding *Free Press* says it has good authority for the statement that R. G. Hart has refused $800,000 for his mine at Old Diggings, Shasta county. Mr. Hart evidently knows when he has a good thing.

LAST Wednesday the regular monthly double dividend of the Centennial-Eureka, amounting to $1 per share, or a total of $30,000, was declared and paid, which brings the total of the company up to $1,350,000.

THE United States assay office at Helena, Montana, last week shipped $135,101 worth of gold bullion to the Philadelphia mint, the largest shipment ever made from Montana, and entirely a State product.

OF the Simmer & Jack mine, Witwatersrand district, S. A., John Hays Hammond predicts that by the time the 280-stamp mill is in operation, enough paying ore will be in sight to keep it running profitably for thirty years.

THE Buckeye, Nev., group of placer mines, twenty-seven miles from Carson, Nev., is sold to Charles Lane of the firm of Lane, Hayward & Hobart of this city, for $200,000. Water will be brought from Alpine county, this State, at a cost of $100,000.

THE Poorman Gold Mining Company has incorporated at Spokane, Wash. The property of the company is located in British Columbia; capital stock, $500,000; incorporators, J. A. Coram of Lowell, Mass.; C. H. Palmer and C. S. Warren of Butte, Mont.; P. Clark, W. J. C. Wakefield, S. I. Silverman and J. A. Finch of Spokane.

W. Q. BROWN AND J. L. SCOTT are getting out 15 tons, or a carload, of nickel ore at Riddles, Or., for shipment to the Chicago smelter. The new Nickel Mine Company, recently organized at Grand Rapids, Mich., will make a thorough test of the ore, and on the result will be based the development and operation of that property.

THE incorporation of the South Paloma Gold Mining Co. includes the two claims formerly known as Gwin Extension and Roach mine. The claims are situated immediately south of the Gwin mine in Calaveras county. The company has opened up the old Roach tunnel eighty feet and is preparing to put in a prospect shaft 5x7.

THE owners of a number of placer claims on the Colorado river, a few miles south of Green River, have sold one claim to Denver men for $2300, exacting from the purchasers an agreement to erect a plant of daily capacity of 500 yards of gravel. Their object is to demonstrate that the fine gold along the river at this point can be profitably handled.

WILLIAM SUTHERLAND, who has charge of the process for working the tailings at Candelaria, Nev., says that the work of bringing the water into the town and to the mines and mill has been completed. There are only ten men now employed, but as soon as the new machinery ordered has been put in place the force will be largely increased and the work begun in earnest.

E. C. HARD of the Terry Hill mine, Spanish Ranch, Plumas county; Will de Vining, Lone Star mine, Kromberg, Plumas county, have been granted hydraulic mining permits by the U. S. Debris Commissioners. Permits to construct impounding works were given this week to the York Mining Company, Brownsville, Yuba county, and James Chapelain, Rackerby, Yuba county.

GREAT BRITAIN'S mineral statistics' blue book for '94, received, shows an increase over '93. The only British gold field yielded 4235 ounces, valued at $74,005: of copper, 446 tons were produced, worth $100,000: of iron, 3,347,472 tons, worth $50,000,000: of silver, 275,696 ounces, worth $175,000: of tin, 8327 tons, worth $3,000,000. The amount of coal mined was 188,277,525 long tons, valued at £62,730,179.

IN answer to sundry inquiries, the general statement is made that the owner or owners of a group of adjacent mining claims can put all the required annual assessment work on any one of the claims, provided that there is joint ownership in all the claims, or, in the case of individual ownership, that one person has all the claims: provided, further, that the work so done can be shown to apply to the proper working or improvement of all the claims in question.

OF Arizona Gov. Hughes says: During the year ending June 30, '95, the gold output was $4,260,000, an increase of $2,179,750 over 1894, and four times as much as in 1893. The silver output was 1,750,000 ounces, a decrease in value over last year of over $500,000. The copper production amounted to 42,661,239 pounds, valued at $6,207,611, and the lead output amounted to $350,000. The total value of bullion exports was $11,955,111.

A COMPANY has been organized to furnish electric light and power for the mining camp of Bingham, 25 miles from Salt Lake, Utah. The company also proposes to apply electricity to the precipitation of copper known to exist in the springs at Bingham. A number of experiments have been conducted, producing a precipitate 45 per cent. copper. The Bingham springs are also said to contain nickel and silver in solution, and the experiments will be continued with a view to saving these metals.

MINT DIRECTOR PRESTON has unofficial information from Russia to the effect that the gold production of Siberia would this year largely exceed the output of last year, when Russia produced $25,000,000 in gold. He estimates the gold production of the world this year at more than $200,000,000, and that of the United States at $46,000,000, being an increase over last year of about $6,000,000. It is thought probable that for the first time South Africa will show a larger annual return than California.

FOLLOWING are late Washington mining incorporations: Main Quesnelle Gold, Dredging & Mining Company; capital, $250,000; incorporators, R. Thompson, E. J. Fader, H. K. Read, F. B. Fox. Montana French Gulch Mining Company, Tacoma; capital, $24,000; incorporators, M. J. Gihlin, H. A. Young, E. C. Mohler, N. J. Brazell. Cedar Canyon Mining Company, Spokane; capital, $200,000; incorporators, W. A. Crawford, J. A. Cameron, I. L. Vanhorn. Homestake Consolidated Mining Company, Spokane; capital, $500,000; incorporators, W. L. Blossom, F. E. Elmendorf, C. N. Cheney, A. Towne.

LONDON *Mining World* wonders in its current issue if its readers have heard of the new trust formed by the New South African Group. Its name is Africana, Limited, and its capital one million sterling. It believes the shares will be brought out at 3?s 6d, which at once puts the capital up to nearly two millions. "Notwithstanding this, the New African people have been so successful, and withal so ably represented, that of all the new trusts that have been floated and which are to be floated we believe this one, especially in Paris, will be received with the greatest favor."

THE Secretary of the Interior has approved grants of lands to the Oregon and California Railroad Company, as successor to the Oregon Central Railroad Company, List No. 16, including 46,091 acres; to the same road, List No. 17, embracing 12,349 acres within the limits of the Oregon City's land district; to the same road, List No. 14, containing 1630 acres; Southern Pacific Railroad (main line), List No. 25, 1152 acres; Southern Pacific Railroad (branch line), California, 206 acres, and 72,130 acres to the Central Pacific Railroad Company, as successor to the California and Oregon Railroad Company.

IN the State of New Jersey there are spots where vast quantities of timber have lain for ages, which, when dug out of the ground, is found to be intact, and, to all intents and purposes, firm and sound as if it were recently cut for building purposes. In regard to its origin, the theory is that a vast timber forest was laid low by some conflict of nature, and then covered up by an upper stratum of earth, which has succeeded in preserving the trees, the first of which was discovered some years ago. It is interesting to note that the system of mining consists in first locating the tree with a rod, and then digging along its length, and by filling the trench with water, causing the tree to rise. Some of the trees are said to have been discovered at a depth of eighty feet.

T. S. CHAPMAN, who has spent three years in visiting the principal mining camps in Mexico and British Columbia, observing the different methods of treatment in vogue, for the purpose of getting some idea as to the process best adapted to his peculiar kind of ore, says one of the best he has ever seen is employed in Mexico, in a gold mine 200 miles from a railroad, reached by mule train, and is as simple as it is satisfactory. The ore is ground very fine and is then roasted in salt and sulphate of copper, the salt freeing the gold and the sulphate of copper creating in the rust-covered particles an affinity for the quicksilver. He says it has been in use at that place in Mexico as long as the stamp mills have been in that country, with success. The rock must be finely pulverized, 100-mesh fineness being required.

A GOOD showing of the mining wealth of the province of Ontario is given in the fourth report of the Bureau of Mines for the year 1894, sent by Archibald Blue, Director of the Bureau, Toronto. The volume contains 261 pages, and is accompanied by maps of parts of the Rainy River district, geologically colored. While the extent and variety of mineral deposits in Ontario are considerable, the mining development has been retarded by the general financial depression, but the possibilities of profitable working appear to be great and the director naturally expresses regret that the people of Ontario do not yet appreciate them. The value of the mineral production in 1894 is stated at $6,086,758, the number of employes as 6075 and the wages amounted to $1,840,289. The largest items in the list are petroleum and its products, natural gas, nickel, copper, brick, stone, lime, tile, sewer pipe, pottery sand, gravel and salt. A small amount of gold was produced. Iron has no place in the table of productions; the last attempt to produce pig iron in Ontario was made as long ago as 1854. An iron furnace is nearly completed at Hamilton, after many delays and misfortunes, and good results are expected from the enterprise. A section of the report is devoted to "the Hinterland of Ontario," the vast region reaching from Lakes Huron and Superior on the south to the Albany river and James Bay on the north, with the boundary line of Quebec on the east and its western limit Rainy river and Lake of the Woods, containing an area of about 140,000 out of the 200,000 square miles of Ontario. An elaborate and instructive paper on "Calcium Carbide and Acetylene Gas" forms another section of the report, and others are devoted to an account of diamond drill explorations, nickel and its uses, etc.

CHARLES JEFFERSON CLARK, a California miner, who, like a good many other California miners, has won fame and fortune in South Africa, has written a letter to a friend of his in this city, in which he tells of what is being done in his jurisdiction. Incidentally, he orders about $30,000 worth of California mining machinery, to be shipped from here to New York, thence to Buluwayo, South Africa, via Port Elizabeth. When it arrives at the end of the railway at Mafeking it will have to be hauled a little matter of seven hundred miles on ox wagons. He has considerable business on hand, but not enough to forget his old acquaintances. In his letter he desires to have the MINING AND SCIENTIFIC PRESS sent to him, wants some California canned fruits, Pacific iron frame mills, and prices and circulars for all classes of redwood timber, redwood shakes, etc. He has also bought considerable mining machinery through Fraser & Chalmers, London, and sends for a 20-stamp mill every week or so. He says: "Harry Webb is over here and is stopping at my house with me. I send you by this mail a paper giving an account of our stand sale here, which brought tremendous prices. Our place is booming, and anyone can make money here who has capital. You will see I bought a stand for $15,000, and will start immediately to build an opera house which will cost $150,000. On Friday I organized the Buluwayo Ice & Cold Storage Co., and shall cable to New York to-morrow for a two-ton ice machine. I only wanted $20,000 for this and got $26,000 subscribed for it in four hours. I have also just floated the Rhodesia Ancient Ruins Co. You will see a notice in the paper I send of a wonderful find of gold ornaments by some parties who are in our new company. I bought the gold from them and paid them $15,000 for it. I have an enormous amount of work to do; have charge of some very large mines, have a large staff of engineers to assist me, and will soon commence a handsome building of our own for offices. I am very badly in need of good, wide-awake foremen and assistants, and almost any number of first class miners could get employment here. We pay them nineteen shillings per day, and their board costs about $35 per month. My old foreman, Tom Burke, is my superintendent in the biggest one of the districts of which I have charge, and old Jack Findlay is out prospecting. There are a number of Californians here and more coming all the time. I went down to Johannesburg about a month ago, and saw Jack Hammond and Sam Connor. Sam is making money. Hammond has made about $750,000, and Wiltsee has just cleared up $50,000 in cash, which he has put in the bank. George Starr is consulting engineer for Barney Barnato, at $25,000 a year, so you see Californians have not taken a back seat in Africa." A good many readers will be glad to hear of Mr. Clark's merited success

Scientific Progress.

Terrestrial Helium.

The announcement by Professor Ramsay of London last April that he had discovered in a terrestrial mineral a substance giving the same spectrum as the substance called helium, and detected up to that time only in the sun and a few stars, was received with some skepticism at first; and, in spite of much corrohorative testimony from independent sources, English scientific publications continued for months to use an interrogation mark, implying editorial doubt, after all headlines referring to the matter. The most serious objection to accepting the genuineness of the supposed discovery was raised early in May by Professor Runge of Hanover, Germany, a recognized authority in spectroscopy. This investigator declared that he and an associate had discovered that the yellow line found in the spectrum of the gas in question was double, whereas the D 3 line had always been referred to as a single line. Rowland, whose tables of wave lengths of the solar spectrum is now generally accepted as the standard, so gives it. Professor Runge, therefore, insisted that, until it was proven that the true helium line is double, the identity of the new-found gas with the peculiar constituent of the sun's chromospheric layer could not be cousidered as established.

During the summer, however, evidence has heen accumulating which removes all doubt on this point. Professor Hale of Chicago, whose lahors iu solar spectroscopy have attracted world-wide attention, finds that the D 3 line really is double; and his measurements of the positions of the two components correspond with those made by Professor Crookes, in England, in the spectrum of the terrestrial gas. Professor Young of Princeton declares that he has not himself noticed the duplicity of the line, in his own chromospheric observations, hut that his assistant, Taylor Reed, has done so on several occasions. At the recent meeting of the British Association for the Advaucement of Science, the president of the chemical section, Professor Raphael Mendola, treats the main question as now definitely settled and pronounces important an incidental problem raised by recent study of the subject.

Almost immediately after his first discovery of helium, Professor Ramsay suggested the possibility that this gas and argon might hoth be composite substances, having one constituent in common. Certain coincidences between the spectra of the two warranted a suspicion of this kind. Professor Lockyer has since obtained, from the mineral broggerite, helium giving not only the principal line (5875.98), hut also the line 4471, which Young cites as occurring in the spectrum of the chromosphere with the same frequency as the other. But when Lockyer experiments with his terrestrial gas, these and other helium lines (especially 6678.3) act dissimilar under a change of temperature instead of all changing simultaneously in brilliancy. This, in Lockyer's judgment, shows that the gas is not a single element, hut a mixture. M. Deslandres, perhaps the most distinguished of French solar spectroscopists, has also discovered a new and strong line in terrestrial helium, at 7065.5, and this corresponds with a line which he has found in argon. As yet the research has not heen pressed far enough to be conclusive, but Ramsay's suggestion has already found partial confirmation.

The new process for the manufacture of white lead by electricity will work a revolution in the white-lead industry. Instead of acetate of lead, as in the old process, sodium nitrate is used together with sodium hicarhonate. A number of cells are filled with the solution, with plates of lead at one pole and of copper at the other. The current from a dynamo causes nitric acid to be liherated and to combine with the lead. A number of reactions occur, with the final production of white lead in a very fine and uniform state and of superior coloring quality. The chemicals can be reused indefinitely. As many as 500 pounds have already been made at one charge.

Huxley's Adherence to Science.

To him indeed, it may be said, science was all in all. He saw, as others see, in science a something which is broadeuing and strengthening human life by unceasingly bending nature to the use of man and making her resources subservient to his desires; he saw the material usefulness of science, but he saw something more. He saw also, as others see, in scieuce a something in which the human mind, exercising and training itself, makes itself at once nimble and strong, and dwelling on which is raised to hroad and high views of the nature of things; he saw in science a means of culture, but he saw something more. He saw in science, even as it is, and still more in science as it will be, the sure and trustworthy guide of men in the dark paths of life. Many a man of science goes, or seems to others to go, through the world ordering his steps hy two ways of thinking. When he is dealing with the matters the treatment of which has given him his scientific position, with physical or biological problems, he thinks iu one way; when he is dealing with other matters—those of morals and religion—he thinks in another way. He seems to have two minds and to pass from the one to the other according to the subject-matter. It was not so with Huxley. He could not split himself or the universe into two halves and treat the one and the other half by two methods radically distinct and in many ways opposed. He applied the one method, which he believed to be the true and fruitful one, to all problems without distinction.—Professor Michael Foster in the Popular Science Monthly for October.

A German chemist has made the discovery of a new compound body, which is said to possess the peculiar quality of solidifying under the action of heat, aud to again revert to the liquid state at a temperature below 32° Fahrenheit. To this substance the name of "crostase" has been given, and it is stated to be ohtained by mixing equal parts of phenol, camphor and saporine, with the addition of a smaller proportion of the essence of trehenthine. It is supposed that, up to the present time, nobody possesses this remarkable property of liquefying when cold and solidifying when hot. Certain substances, such as albumen, harden when exposed to heat: but once they have attained this condition, they cannot he made to resume the liquid state, although they may be subjected to exceedingly low temperatures.

Mechanical Progress.

Tempering Steel.

The following points on tempering steel are uoted by an experienced mechanic:

Every toolmaker has a way of his own of working and tempering steel. Either he has a particular way of heating or a special way to anneal, or perhaps these may uot seem as important as the cooling mixture used in hardening; yet, to some one or all of these he attributes his usual success. He will listen respectfully to other ways of working and agree that you have been very successful, hut thinks that your last job that cracked or warped could have been saved if you had done it his way. There is prohably more reason in his method than we who have our particular way are willing to admit. It is not, perhaps, so much in the treatment he gives the steel as the fact that he has a system and adheres to it, and having found a brand of steel suited to his work is able to secure good results. This is a much better way than a haphazard method of working, hut a knowledge of the characteristics of steel and the principles governing its successful use will enable the workman to get more uniform results, especially if there is much variety in his work.

Probably the most serious injury to which a piece of steel is liable is in the heating, either for annealing or hardening. As the annealing is the first operation after the piece is cut from the bar, we will consider that first.

A charcoal fire is desirable, but probably most of the steel used is heated in a soft coal fire, and if the coal is well coked results equally good can he ohtained. It would make no difference which is used if there were no sulphur in the coal, which seriously injures steel. Coke contains so little that no harm can result, as it could only spoil the outside, and that is already damaged by the work done in the rolling mill and will be removed in the machining of the piece. In any case the fire should be large and deep enough under the work to prevent jets of cold air from coming up through the coal and causing uneven heating. A slow and even heat is absolutely necessary. Have the fire well lighted and glowing evenly (hut not hotter than a hright red), and reduce the blast before putting in the steel. This will give a mass of coal that will heat the work from all sides about alike. If the heat is fierce the corners will get hot too soon, and probably too hot hefore the middle is hot enough. There is not much danger of heing too slow in the heating if the fire is even and large, although steel should never be allowed to "soak" in a firc. The heat should enter the piece steadily, as much heing taken in one second as entered the second before, and will in the succeeding one.

Be very careful not to overheat the work. If hot enough to harden it is hot enough to anneal. To heat more is to make the steel granular and brittle. Don't handle the work with cold tongs, or expose it to the air auy more than can be helped, as the success of the annealing depends on making it cool very slowly. It hegins to cool the instant it is removed from the fire, and then is the time to keep the heat in. This is all the more essential if the above caution against overheating is observed, as you have no heat to waste. Powdered lime, wood ashes, etc., are good to hury the piece in to prevent rapid cooling. Perhaps the ideal would be red hot asbestos, but ashes are more common, and if properly used are good enough. Wood ashes are better than coal ashes, probably hecause they are lighter and do not conduct away the heat so quickly. A very good mixture is dry sawdust and ashes mixed; the sawdust will take fire, and smouldering for a while will keep the work hot. Whatever is used it must he heated before the steel is put in, as the steel in warming up the ashes will cool quickly enough to make the subsequent slow cooling useless. It is the time taken for the temperature to fall from the heat necessary to harden to that indicated by a dull red that determines the softness of the steel.

J. E. Masters and John L. Huhhard, blacksmiths in Hall Bros.' shipyard at Port Blakeley, Wash., have succeeded in welding copper and iron or steel—a process the accomplishment of which has for centuries baffled the most skillfull mechanics of the world. They say: "What we have done is simply to secure a perfect welding of a sheet of copper and a sheet of steel. To what practical applications the work may he put, neither of us can surmise." They show a plain sheet of two metals, so perfectly united that they seemed but parts of an indivisible whole, copper on one side and steel on the other. The sheet is about 2.5 hy 3 inches, with an average thickness of $\frac{1}{8}$ of an inch. While it shows a complete welding, yet a tranverse section shows plainly the line of distinction between the two metals, clinging together with such cohension that no sledge hammer or cold-chisel has been able to separate them. They are satisfied that what has been done thus far ou a small scale can be easily done on a larger. They have not yet protected themselves by patent, and of course guard the secret of their method with the greatest care.

Electrical Progress.

The Monocyclic System in Salt Lake, Utah.

The monocyclic system developed by the General Electric Company is ahout to be used in Salt Lake City, the distribution heing made on the three-wire secondary method from large transformers. Most of the lighting will be confined to a space covering ahout six hlocks, and as the hlocks in Salt Lake City are 800 feet square, the territory covered is somewhat large. A branch line will run from one corner of the district for ahout a mile along the best residential street, while another line will run out from auother corner of the district for about 1500 feet to the county and city huilding. These lines will be gradually extended over other parts of the residential district as soon as the demand for such an extension arises.

The station will he located on the railroad track, 3000 feet from the nearest side of the rectangular district of six hlocks, and 4800 feet from the farthest side.

The generating plant will consist of two 150 K. W. 2000-volt monocyclic alternators, helted directly to two steam engines. As the large blocks are more or less open, the center space being occupied by stores, harns, etc., room is thus afforded for the pole lines for the secondary wires around the inside of the hlock. From these service wires will he run into the rear of the huildings. The plans contemplate the installation of two 3-wire transformers to each hlock, one on each side of this interior court and the 3-wire secondaries running around the court will be directly supplied from these transformers. As the uumber of lights in the hlock is increased, the transformer equipment will be expanded.

For lightiug the residential district from the branch lines, the usual course of using small transformers will be followed, bunching them as far as possible.

Motors are to be connected at once as required, the balance wire being introduced only for motor work. The monocyclic system was selected chiefly on account of the facilities it offers for the economical operation of motors, and the fact that it allows of a practical solution of the day-load difficulty.

The Pittshurg Reduction Company has closed a coutract with the Niagara Falls Hydraulic Power Mauufacturing Company for 3000 horse power, delivered in the shaft of the turbines to be placed under the high hank hy the Hydraulic Power Company, this power to be furnished at a remarkahly low figure. The Reduction Company will install upon these turbiues direct current geuerators, the current from which will he used for the manufacture of aluminum.

There has been devised an efficient electric bicycle lamp, which is composed of a dry battery one-half inch in diameter and four inches long. A continuous light is supplied for 150 hours without recharging. The advantages of the lamp are that there is no smoke, and the vibration of the whcel does not affect the light, which is far hrighter than the oil lamp. An inexpert person cau remove an old battery and replace it with a uew one.

Electrical engineers question the ecouomy and feasibility of using for long distances the form of trolley employed on the Baltimore tunuel switching engines, aud also doubt whether motors of such great weight (ninety-six tons) are required for light, fast trains. Those two machines have, however, proved successful in the work for which they were built—transferring heavy through expresses and freights across the city.

A story which must he taken with reserve comes from Birmingham, England. It is said that a new primary battery has heen inveuted which uses a substitute for zinc costing one-

twentieth as much as that metal, and greatly cheapening the cost of producing electricity. A system of circulating the fluids has also been devised to prevent "polarization" (a paralyzing deposit of material on the plates), so that the battery will run steadily for ten hours and recuperate in ten minutes.

Practical Information.

Advantages of Heating Feed Water.

The percentage of saving of fuel resulting from heating feed water by exhaust steam or waste gases is expressed by a foreign writer by this formula:

$$\frac{100(T-t)}{H-t} = \text{percentage of saving.}$$

Where H = the total heat in the steam at boiler pressure; T = temperature of feed water after heating; and t = temperature of feed water before heating. Thus, suppose a boiler working at a pressure of sixty pounds per square inch above the atmosphere, fed at a temperature of 60° F., and driving a non-condensing engine, the exhaust steam from which is allowed to escape into the atmosphere. By utilizing this exhaust steam in a properly designed feed water heater to raise the temperature of the water to, say, 212° F., the percentage of saving of fuel would be:

$$\frac{100(212-60)}{1207.2-60} = 13.24 \text{ per cent saving}$$

effected. Where H = 1207.2 (the total units of heat in steam at sixty pounds pressure above the atmosphere); T = 212° (the temperature of feed water after heating): t = 60° (the temperature of feed water before heating).

If the feed water is drawn from the hot well of a condensing engine at, say, 100° F. temperature, the result of heating it to 275° F. in an economizer in the fuel would work out to:

$$\frac{100(275-100)}{1207\ 2-100} = 15.8 \text{ percentage of}$$

economy gained. With a coal consumption of only fifteen tons per week (the coal costing, say, 8s. per ton), the saving in the cost of coal alone, taking the lower figure of 13.24 per cent, would amount to $200 in a year, which would more than cover the outlay of installing a suitable heater, the subsequent economy being so much clear profit. The relative saving would, of course, be greater with coal costing more, or by raising the temperature of the feed water higher.

In addition to the actual saving of fuel resulting from the heating of feed water, there are incidental advantages accruing, which, although not so strikingly apparent as a reduction in the coal bill, are none the less real, among which may be mentioned the obviating of expensive repairs and renewals due to wear and tear caused by unequal contraction when the hot places are cooled by currents much below the normal temperature of the great bulk of the water in the boiler. More power can be obtained from boilers fed with hot water, as the heat from the fuel performs its proper function of evaporating, instead of being partly dissipated in raising the temperature of the water to boiling point. Priming and smoke emission often result from having to force the fires to heat up large quantities of cold water in the boilers when this has not been previously heated.

With limy waters a considerable proportion of the lime salts is precipitated by heating the water to boiling point, and this is especially the case where suitable reagents are used, with the result that purer water is sent to the boilers, obviating to a great extent the evils of incrustation and internal corrosion.

A SATISFACTORY METHOD of removing sticky deposits of grease and dirt from parts of machinery by means of soda ash is reported, as follows: To 1000 parts by weight of water, about 10 or 15 parts caustic soda and 100 parts ordinary soda is the rule. This mixture is boiled, and the parts of the machine that are to be cleaned are placed in it, this treatment having the effect of quickly loosening all grease, oil and dirt, after which the metal is thoroughly washed and dried. The action of the lye is, of course, to form with the grease soaps soluble in water; and to prevent the lubricating oil, etc., hardening upon the parts of the machinery when in use, a third part of kerosene is added.

Artificial Marble.

"Nine tenths of the marble-topped tables and so on—what I might call furniture marble—seen in this country are made of artificial marble," says a man in the trade.

Thousands of tons of this mock marble are made annually, and even men in the trade can scarcely tell the difference between the real and the false article, for the markings or marblings go wholly through the block and are not merely superficial. The basis of the whole is a combination of limestone and chalk, which, chemically treated, can be made of any shade desired. The artificial marble in the rough is placed in a water bath, and upon this is sprinkled a sort of varnish, consisting of sequioxide of iron, gum and turpentine, and all manner of marbled designs are produced when the turpentine is broken up by the addition of water.

Any pattern of marbling can be produced to order. Once such pattern appears the air is expelled from the block and the colors are fixed by the immersion of the stone in sulphate and warm water baths, and then another bath of sulphate and zinc so closes up the pores and hardens the stone that it acquires the density of the natural article and can be cut and polished in the same manner.

The Earth's Unseen Moons.

Astronomers conceive it to be possible for the earth, under certain circumstances, to capture as satellites some of the roving meteoric bodies known to be numerous in space, instead of bringing them to the surface as aerolites. As these bodies are too small to be seen—a mass of 100 tons being invisible at 800 or 1000 miles when brightly lighted—the earth may be attended by hundreds of invisible moons. Sir J. Hirschel was even of the opinion that they may be large enough to be visible for brief intervals when beyond the earth's shadow; and Sir John Lubbock has supplied formulæ for calculating the distances from observations of this kind. M. Petit, director of the observatory at Toulouse, has been led by observation and calculation to conclude that the earth is attended by at least one meteoric stone of considerable size. It is about 26 times nearer than the moon, its orbit being 5000 miles from the earth's surface, or 9000 from the center, and the tiny moon revolves around the earth in three hours and twenty minutes.

PERMANGANATE OF LIME is advocated for the purification of water, as it is said to split up very readily in the presence of organic matter into oxygen, oxide of manganese, and lime, having great oxidizing power and capable of destroying micro-organisms. It has the advantage also of being neither poisonous nor caustic. M. Bordas is said to have concluded, from comparative experiments, that permanganate of potash has only a one-hundredth part of the sterilizing power of permanganate of lime.

IF the assertion of Friedr. Krupp, the gun manufacturer of Essen, Germany, be true that an addition of tungstate of soda to electric light carbons will increase their duration, it will lead to a great demand for this article. Krupp claims that he prolonged the life of the carbons by 17 per cent, and even by 28 per cent when the lower carbons were taken somewhat thicker.

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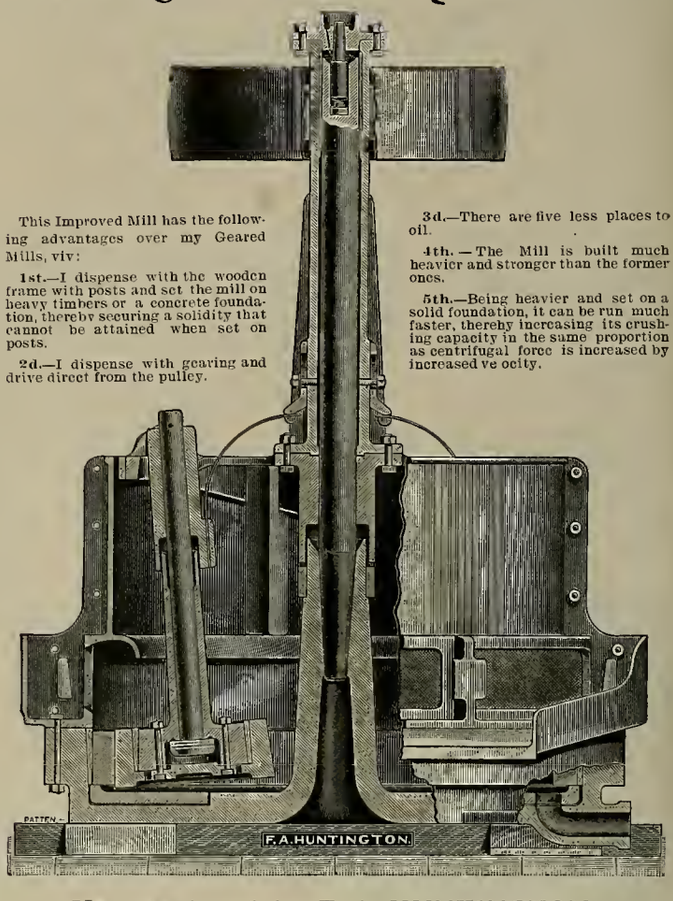
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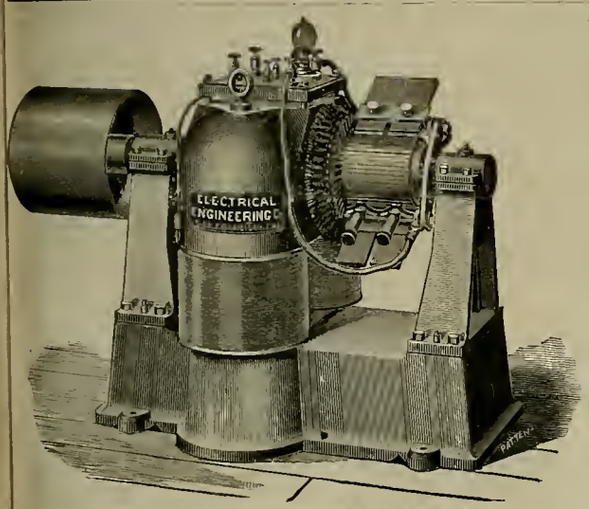
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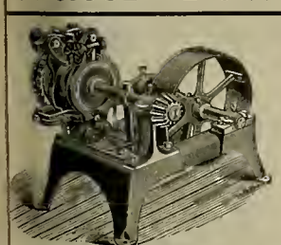
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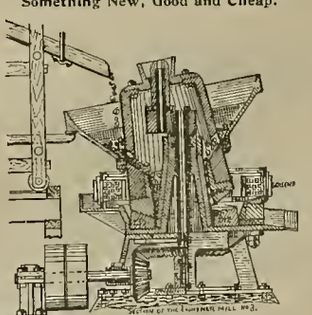
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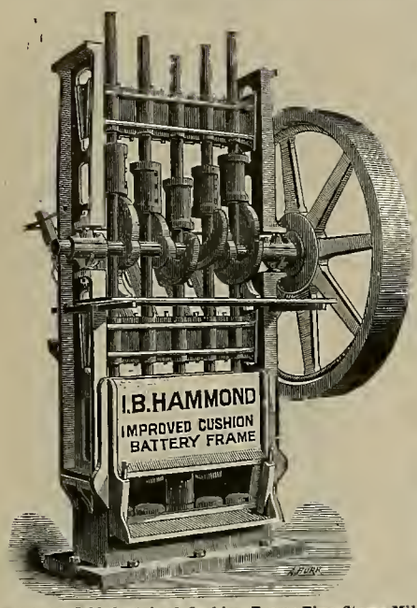
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The Improved, Iron-Frame, Self-Contained, Cushion-Frame, Five-Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space. The term "Setf-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

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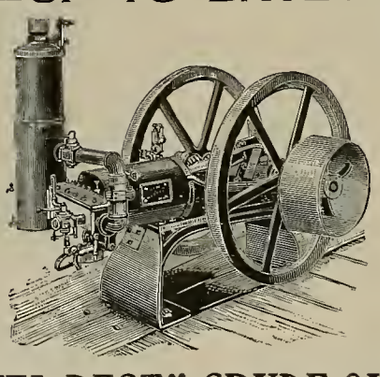
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Will furnish power for one-tenth of a cent per horse power per hour. It is the cheapest power ever produced, as shown in the following table, and which is based upon a test of ten hours' run with one of our five-horse power Gasoline Engines, using gasoline (74°), coal gas, common domestic coal oil, crude petroleum, asphaltum base, crude petroleum, paraffine base, as follows:

Coal Gas, ten hours' run, 1000 feet	$2 00
Gasoline (74 deg.), ten hours' run, 8¾ gallons @ 14c	1 25
Coal Oil, ten hours' run, 7½ gallons @ 10c	75
Crude Petroleum, asphaltum base, 16 gallons @ 3c	48
Crude Petroleum (36 deg.), paraffine base, 13 gallons @ 5c	65

On the crude petroleum with asphaltum base we had an over-product of 7 gallons of asphaltum; the market price is 3 cents per gallon=21 cents. This deducted from the first cost of the crude petroleum for ten hours' run leaves a net balance of 27 cents. And from the crude oil with a paraffine base we had an over-product of 3 gallons of good lubricating oil, which we consider equal to any we have ever used, but will estimate its value conservatively at 20 cents per gallon, making 60 cents; this deducted from the first cost of the crude oil leaves a balance of 5 cents, total cost of running ten hours.

It will be readily seen that the operation of these Engines with crude petroleum reduces the cost of operation to a minimum. Crude petroleum with paraffine base at 1-10c per horse power per hour; on crude petroleum, asphaltum base, ¼c per horse power per hour; on domestic coal oil, 1½c per horse power per hour; and on gasoline, 2½c per horse power per hour.

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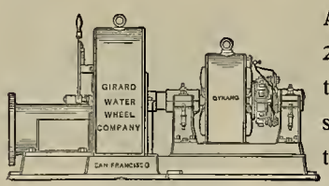
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THE PELTON WATER WHEEL CO.,

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American Girard Water Wheel.



Adaptable to all heads between 30 feet and 2000 feet, particularly where economy in the use of water and fine regulation are desired, as, for instance, the operation of electric dynamos.

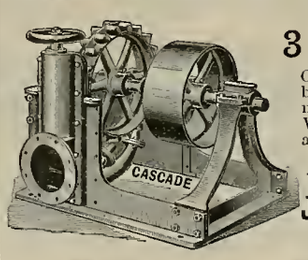
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Adapted to all Heads from

3 Feet to 2000 Feet.



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MINE BELL SIGNALS.

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Automatic Cut-Off Engines, High-Speed Engines, Hoisting Engines, Quartz Mills,
Manty Chill Mills, Rolls and Concentrating Machinery, Dodd Sigmoidal Water Wheel,
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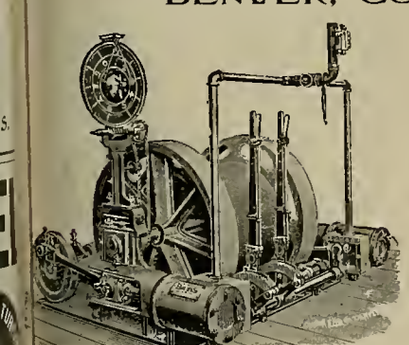
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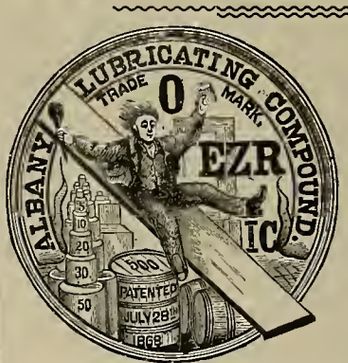
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General Mining Machinery and Supplies.

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THE

Merralls Hydraulic Quartz Mill,

The Greatest Ore and Rock Pulverizer in the World, Either Wet or Dry.

THE ONLY MILL BUILT THAT RIVALS STAMPS. Our six-foot mill (No. 1) will reduce the ore or rock to pulp than a ten-stamp mill, with less than one-half the power and less than one-half the wear and tear, besides saving a much larger per cent of the gold in the ore.

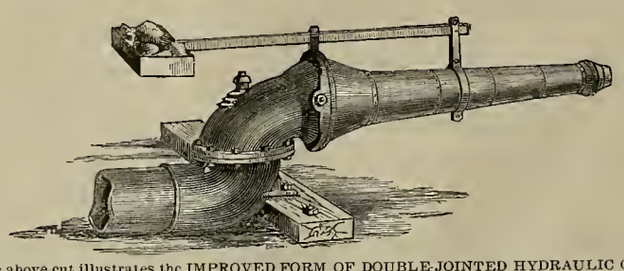
This mill will reduce from 25 to 500 per cent more ore than any other rotary mill in use. Cheap, simple and economical. Four sizes built—from 15 to 250 tons capacity.

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147 Fremont Street ..... San Francisco, Cal.

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The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 42 Fremont St., San Francisco.

Market Reports.

The Markets.

SAN FRANCISCO, Oct. 17, 1895.

Silver, which showed so gratifying an advance last week, fell back a few points during this week. The metal market in general is still advancing, copper being especially firm.

New York Metal Market.

NEW YORK, Oct. 17.—PIG IRON—Southern, 12@14.50; Northern, 12@14.00.

COPPER — Brokers', 12.00c; exchange, 12.25c.

LEAD—Brokers', $3.15; exchange, $3.40.

TIN—Straits, 14.70@14.75c.

SPELTER—Domestic, $4.15.

New York Silver Prices.

NEW YORK, Oct. 17.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	31⅛	68⅜	12 00	.....
Saturday	31⅛	68¼	12 15	3 25
Monday	31	68⅜	.....	3 20
Tuesday	31⅛	68	.....	.....
Wednesday	31	68	12 20	3 25
Thursday	31	68	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.87½
London Merchants	$4.86
London Sight Bankers	$4.88¼
Refined Silver, per ounce	68c
Mexican Dollars, nominal	56c

San Francisco Metal Market.

COPPER.

Bolt	¼ & 5-16, 20c;	⅜ and larger,	20c
Lake Superior Sheathing	22	@	—
Ingot, jobbing	—	@	18
Ingot, wholesale	17	@	16
Sheet copper	—	@	21

ZINC.

Sheet	9½@		

LEAD.

Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "	"	...	1 45
Buck, Balls and Chilled, do, "	"	...	1 45

IRON.

American Soft	16 00	@	18 00
Pig, per ton	18 00	@	20 00

STEEL.

English, lb	16	@	19

ANTIMONY.

Per lb	—	@	10½

PIG TIN.

Per lb	15	@	16 00

QUICKSILVER.

Home trade, per flask	39 00	@	40 —

TIN PLATE.

Per bx	5 25	@	6 00

ZINC.

Sheet	8½@		

BORAX.

Refined, in car lots	—	@	5⅛
Refined, in sacks and barrels	—	@	5⅜
Powdered, in car lots	—	@	5⅜
Concentrated, "	—	@	4⅞

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 50
Greta	7 50
Nanaimo	7 00
Gilman	6 50
Seattle	7 00
Coos Bay	5 50
Cannel	8 50
Egg, hard	13 00
Wallsend	7 50
Scotch Splint	8 00
Brymbo	8 00

TO ARRIVE—CARGO LOTS.

Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

COKE.

Gas Companies'	75c ₱ bbl		
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —

NAILS.

Wire	$3 50
Cut	3 25

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, October 17, 1895.

While a vast majority of persons dealing in mining shares have become more pronounced in their bearish proclivities, shrewd and successful operators who are not swayed by surface inclinations are becoming more pronounced in their hullish views. While the latter hold to the belief that the manipulation of the market may and probably will send prices slightly lower, yet there would be nothing in this to warrant the assertion that they will not recover and still better figures obtain before long. This view of the situation they form from past experience, for they say that mining share markets, like history, repeats itself. From the action of the market the manipulation has been changed, and in doing this regular traders for turns or otherwise are laboring at a disadvantage in trying to guess how things will go even from day to day. The taking up of one or two stocks in a group to make active at stronger prices leads to general selling when the leader begins to sag off. This affords unmistakable evidence that it is to create a selling pressure and not a buying desire from outside operators. Every conceivable kind of bear points are put out, and not one of a favorable character. This is done in the interest of those who see better things in the future, although, as stated above, slightly lower prices may rule first.

The feature of the market the past week was an advance in Confidence and Challenge on Friday and Saturday. The former, on regular call, sold up to $2.15 and the latter to 76 cents, although after call they sold slightly higher. The advance was chiefly on shorts. They then sold down a little more than 15 per cent, carrying the others in that group down also. On Saturday, under outside buying, Hale & Norcross sold up to $1.70 after call, due to a report about a court decision regarding the pending suit; but with better information regarding it, prices fell off, unfavorably affecting prices for shares in the middle group. No sooner did Hale & Norcross begin to sell down than Union and Sierra Nevada showed strength. The former sold on Tuesday up to 97 cents and the latter to 76 cents. Their advance did not strengthen the shares in that end; but when they sold lower, then the others followed down in sympathy. It is this kind of manipulation that is mystifying the "street," creating bears and bringing in sellers from the outside public, yet no one should run away with the idea that a big deal is near at hand even under better concentration, for this will not come until men with large capital combine and come into the market, and they will not do so until something is shown up which justifies them venturing in and backing the proposition with $20-pieces. The market this morning was active at lower prices, with the public selling.

From the Comstock mines our advices are essentially unchanged from that given last week. In Alta they cut into ore going above $30 a ton. In the Gold Hill group Belcher and Seg. Belcher's joint west drift is being pushed ahead. They expect to strike the west lode about 90 feet farther in. Crown Point continues to extract and mill some low grade gold ore, which merely pays for the extension work going on in the mine. The west drift is being run. From Yellow Jacket reliable information is hard to get, but it is reported that favorable advices ought to come to hand before long. In Confidence a north lateral drift is being run so as to crosscut the lode at different points. On the surface tunnel the west drift ought to be near the downward continuation of the ore found above. It is thought that when this is struck better prices will follow, but it may send them down first, for the share market goes by the rule of contraries. The west drift in Con. Imperial and that in Alpha are being run at the rate of about 2½ feet a day. This means that the ore will not be struck under from four to six weeks. In both Bullion and Gould & Curry slow work is being done in the long west owing to the distance in and the character of the ground. In Potosi, Chollar, Hale & Norcross and Savage the work is about of the same character heretofore given. It does not indicate anything calculated to excite the curiosity of dealers. In Con. Virginia, Ophir, Mexican, Union and Sierra Nevada there is more work being done than for many months, and this work is in ground which may give good results. Those who have information of the work being done are quite hopeful; still they say that considerable exploiting and developing will have to be done. This means time and money. From the Bodie district nothing new comes to hand. More exploiting work seems to be done in the mines. The Brunswick lode is spoken of very encouragingly by those who should be in position to know. The work now under way will soon be followed by more important, when good results are looked for with considerable confidence.

The lowest and highest prices paid on regular call from Oct. 10 to Oct. 16, inclusive, were as follows:

	Lowest.	*Highest.*
Alta	$ 07	$ 10
Alpha	08	12
Andes	36	43
Belcher	47	56
Best & Belcher	93	97
Bodie	25	30
Bullion	13	....
Bulwer	05	....
Caledonia	11	....
Challenge	64	76
Chollar	48	56
Con. Virginia	2 45	2 65
Con. Imperial	03	....
Confidence	1 70	2 15
Crown Point	38	45
Exchequer	03	....
Gould & Curry	45	50
Hale & Norcross	1 30	1 45
Justice	05	....
Kentuck	08	09
Mexican	65	74
Mono	....	....
Occidental	15	16
Ophir	1 45	1 60
Overman	13	17
Potosi	55	67
Savage	33	40
Seg. Belcher	16	17
Sierra Nevada	86	97
Union	60	76
Utah	09	....
Yellow Jacket	39	49

LONDON—Talk in New York about increasing confidence abroad in American securities may be true theoretically, but for all practical purposes not five per cent of investors or speculators here are thinking about American securities one way or the other. The attitude is one of the complete indifference. The large houses which have been identified with American stocks are still in that market. Raphael, Leon, Borthwick-Warck, Higgins & Clark, Satterthwaite and other large houses are still in Americans, but the rank and file which used to number four or five hundred men have gone into Kaffirs. I wrote you, the other day, that Kaffir market numbered hundreds of brokers. Since then, I have taken pains to approximate the attendance there and think it entirely safe to say that of the 3,000 members of the London Stock Exchange at least 2,000 are dealing in South African or Australian mining shares. Fully ninety per cent of the present volume of business in the London Exchange is in mining stocks.

In order to determine whether there was really any defined "sentiment" anywhere in regard to the securities, I talked with several houses here principally identified with American securities. Those who really knew something of our affairs insisted that our currency is unsound and redundant, and lay stress on the insufficiency of Treasury revenue, and the danger always present as a result of the greenhacks' existence. Those who knew comparatively little of our affairs talked about "dishonest management" of our railroads, and so on, but without very much discrimination or discretion. They seemed to think all American railroad men were highway robbers in a thin disguise. Of course they knew little or nothing of the real position of affairs. The disgust of the average American "jobber" or "dealer" at the course of the market is quite comical. His complaint is that just when everything looks promising for an advance, stock is heavily sold from New York, and the advance is squelched.

There are some really intelligent firms here, however, who appreciate the position of the United States quite as well as we do ourselves, and are extremely well informed as to many of our important systems. They fear the currency trouble, but not to such an extent as others and rather believe that the solution will come in time in the shape of the immense increase in gold production that is assured for the next ten years at all events. Just at present they are altogether indisposed to touch our securities other than gilt-edged gold bonds. In short, it does not seem that London will be a factor of importance in our market for some time to come. Probably not until it is made clear that our currency problem will be tackled in real earnest and solved in a sound and comprehensive manner, shall we have European investment in our securities on a large scale. When, however, it does begin it will be on a scale, unexampled, not merely in the last few years, but in the history of the country.—Cor. Dow, Jones & Co.

The following illustrates the changes of the week:

MINES.	Oct. 10	Oct. 17
Alpha	.....	$ 08
Alta Consolidated	.....	17
Andes	$ 43	34
Belcher	57	46
Best & Belcher	97	84
Bodie	.....	26
Bullion	.....	.....
Challenge	74	60
Chollar	54	45
Confidence	2 00	1 65
Consolidated California and Virginia	2 65	2 40
Consolidated New York	.....	.....
Crown Point	.....	37
Exchequer	03	03
Gould & Curry	50	42
Hale & Norcross	.....	1 35
Justice	05	.....
Mexican	74	64
Ophir	.....	1 40
Overman	.....	12
Potosi	.....	57
Savage	40	31
Sierra Nevada	96	91
Union	68	72
Utah	.....	.....
Yellow Jacket	45	38

San Francisco Stock Board Sales.

SAN FRANCISCO, Oct. 17, 1895.

9:30 A. M. SESSION.

400 Alpha	08	100 Hale & Norcross	1 35
500 Andes	34	100	1 40
100 Best & Belcher	84	500 Occidental	63
100	83	500 Occidental	14
300	82	200 Overman	13
150 Challenge	60	250 Potosi	57
200	59	600 Savage	31
400 Chollar	45	1000 Scorpion	03
200 C. C. & Va	2 40	100 S B & M	14
100	2 45	100 Sierra Nevada	87
50 Confidence	1 65	350	88
100	1 60	100 Union	67
100 Crown Point	36	600	68
300 Exchequer	03	100	69
200 Gould & Curry	42	100 Yellow Jacket	38

SECOND SESSION—2:30 P. M.

550 Alta	17	100 Mexican	64
500 Andes	32	100 Ophir	1 40
100 Belcher	46	200 Overman	12
100 Best & Belcher	84	400 Potosi	55
300 Bodie	26	150 Savage	31
200 Challenge	56	200 Sierra Nevada	91
100	57	700	92
250 Chollar	45	40	90
250	44	400 S. B. & M	13
150 Confidence	1 55	700 Union	72
25	1 50	100	71
100 Crown Point	37	850 Yellow Jacket	38

Coast Industrial Notes.

—California was second, with 713,480 bushels, on the list of States in the bean crop of '94.

—The Shasta Lumber Co. has an order from the Mountain Mining Co. for 38,000 railroad ties and 1,500,000 feet of lumber.

—The S. P. Co. water works recently put in two new patent automatic water columns at Gold Run, the first of the kind to be used on the coast.

—The Shipowners' Association of this city has started a movement to do away with the employment of pilots and the taxation of floating property.

—In the State there are 6459.739 miles of railroad, assessed for $43,018,640. The amount of State taxes is $294,677.64; county taxes, $490,708.58; total State and county taxes, $785,386.22.

—The Union Iron Works has the contract for two of the six composite gunboats for the U. S. navy, and will begin work on them by December 1st. They will cost $230,000 each, exclusive of armament.

—According to the Mexican *Herald* during the past three months drafts for over two and and a half million dollars in gold have passed through the Wells-Fargo Express Company with which to purchase Mexican dollars for the Japanese government.

—Secretary of the Navy Herbert has under consideration the report of the Board of Naval Bureau chiefs on proposals submitted for building six light-draft gunboats, which recommends the award of one of the single-screw boats to the Union Iron Works.

—The Consolidated Canal Company, near Messa, fifteen miles east of Phœnix, Arizona, is building a power house where a crosscut canal will deliver 10,000 inches of water to the Tempe canal. The intent is to develop 700 horse power by three turbines, for electric lighting of Mesa, Tempe and Phœnix.

—The Nevada Southern railroad was sold at sheriff's sale in San Bernardino last Wednesday for $153,966 to K. B. Anderson, who is believed to represent the recently organized California and Eastern Railroad Co., backed by Denver and Chicago men. By itself the line is valueless, and appears to be worth more to the A. & P. Co. than any other corporation.

—An effort is being made by business men of Spokane, as well as those of the Big Bend country, Washington, to have the bondholders of the Washington Central take charge of the road and run it as an independent line. The line was constructed as a feeder for the Northern Pacific, and when the main line went into the hands of a receiver the Washington Central followed suit.

—The Commercial Oil Company of Los Angeles have a process by which they say better lubricating oils can be made from the Los Angeles crude oil than from the Eastern crude oils. The process leaves the asphaltum uninjured by the heat, as good as the best imported and much cheaper. The company now furnishes distillate for gasoline engines and oil burners, and fuel oil for steam boilers and furnaces.

Commercial Paragraphs.

OWING to the increased demand for "P. & B." products abroad, it has become necessary for the Staudard Paint Company, No. 2 Liberty street, New York City, to establish headquarters of its own in England. For this purpose President Shainwald sailed on the St. Louis on Wednesday, September 25th. Mr. Shainwald contemplates spending two or three months abroad and expects to establish agencies for the sale of "P. & B." products in all the principal foreign cities.

THE E. P. Allis Co., of Milwaukee, have been awarded a contract by the Andrews Brothers Company, Haselton, O., for two heavy staudard type vertical blowing engines which will be capable of delivering the air at a pressure of twenty-five pounds per square inch, with the engine running at a speed of fifty revolutions per minute. They have also received a contract for two 16x36 inch Reynolds-Corliss 1890 type engines from the Bellaire (O.) Nail Works Company.

THE Niagara Falls Hydraulic Power and Manufacturing Company has just contracted with James Leffel & Co., of Springfield, Ohio, for four of their improved double discharge horizontal shaft turbine wheels, of 7500-horse power capacity, which is far the largest here under which turbines of large capacity have ever been applied in this country or elsewhere. These wheels will drive eight large electrical generators, one being placed on each side of each wheel, connecting directly to the horizontal shaft of the turbine, without gears or belting, the electrical current being used for power and lighting purposes. This is the second large order for turbines built by James Leffel & Co. for Niagara Falls, the two being already several of their wheels of 12,000 horse power each in the Cliff Paper Co.'s new mills, located at the foot of the cliffs near the tunnel. The said Leffel Company are building also four of their Cascade wheels for one company, to be operated under 730 feet head. The part of these wheels being connected directly also to generators, for power in mining operations, the Cascade wheel being essentially and entirely different from the turbine, operating upon an impulse and reaction principle. These Cascade wheels will have an aggregate capacity of 600-horse power.

THE mining department of the Edward Allis Co., of Milwaukee, Wis., is experiencing a reign of prosperity, having 1500 men on the payroll, busily preparing for shipment the

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	*No.*	*Amt.*	*Levied, Delinq't and Sale.*	*Secretary.*
Alpha Con, Nev	15	10c	Sept 30, Nov 5, Nov 28	C E Elliott, 79 Nevada Block
Alta S M Co, Nev	50	10c	Sept 16, Oct 21, Nov 11	J E Jacobus, 309 Montgomery
Gray Eagle M Co, Cal	41	5c	Sept 23, Oct 28, Nov 22	W J Gurnett, 308 Pine
Nevada Queen M Co, Nev	9	5c	Sept 13, Oct 16, Nov 12	Wm. Bowers, 331 Pine
Occidental Con M Co, Nev	20	10c	Oct 1, Nov 14, Nov 25	Alfred K Duchrow, 69 Nevada Block
Seg Belcher, Nev	16	10c	Sept 12, Oct 15, Nov 4	E B Holmes, 309 Montgomery
Savage Mining Co, Nev	87	20c	Sept 20, Oct 23, Nov 12	E B Holmes, 309 Montgomery

MEETINGS.

Company and Location.	*Secretary and Office in S. F.*	*Date*
Anchor Coal & Developmeht Co, Cal	E D Farish, Room 5, 632 Market	Oct 21
Con Cal & Va M Co, Nev	E W Havens, 58 Nevada Block	Oct 21
Eureka Con M Co, Nev	H P Bush, 134 Market	Oct 21

lowing contracts: A steam hoist and concentrator for F. Lopez y Gutierrez, of San Luis, Mexico; a deep mine pump and concentrator for Maximiliano Damm, of Durango, Mexico; a 100-ton concentrator for the Byron N. White Co., Three Forks, B. C.; an air compressor and sinking pump for the Kootenay Mining Co., of Pilot Bay, B. C.; a 10-stamp gold mill for the Giles Gold M. & M. Co., of Boulder, Colo.; an air compressor for the Standard mine, of Wallace, Idaho; a copper smelter for the Copper Queen Cons. Mining Co., of Bisbee, Ariz.; a concentrator and copper smelter for the Detroit Copper Mining Co., of Morenci, Ariz; a 20-stamp gold mill for the Yellow Jacket Mining Co. in Idaho; a 5-stamp gold mill and power plant for the Crow Peak Mining Co., of Spear Fish, S. Dak.; a hydraulic hoist with Pelton wheel for the Bunker Hill and Sullivan mine, near Kellogg, Idaho; a roller process lead mill for Jno. F. Lewis Co., of Philadelphia, Pa.; an 18x36 Corliss steam plant for the Silverton (Colo.) Mining and Smelting Co.; and a roller process chlorination and steam plant for the Sunshine mine, of Salt Lake City, Utah.

Personal.

HENRY JANIN is visiting Trail Creek, B. C., mines.

MR. H. T. SCOTT has returned from a visit to the Atlantic slope.

GOV. BUSH has fled from the tules to the hills, and is at Alta this week.

J. J. HILL will resign the presidency of the Great Northern Railway Co., Jan. 1, '96.

F. S. MITCHELL, Butte, Montana, is now master mechanic for the Montana Ore Purchasing Co.

D. B. HANSON, representing the E. P. Allis Co., has returned from a business trip to Humboldt Co.

JAS. PROBARE is about to put up a steam hoist at the Vorlander mine, Amador Co., and actively develop the property.

HAMILTON SMITH, who has been looking at the Anaconda, Montana, copper properties, has returned to Cripple Creek, Colo.

MARK B. KERR is superintending the mining operations of the South Paloma G. M. Co. at Valley Springs, Calaveras Co., Cal.

THOMAS JENKINS, late superintendent for the Sierra Butte Co., Whitlocks, Mariposa Co., has resigned his position and goes to England.

C. P. HUNTINGTON scoffs at the Butte, California and Boise R'y., and says it will not be built: thinks there are too many railroads now for profit.

JESSE COULTER, recently superintendent of the Nelson Hydraulic Mining Company, Forty-mile creek, Nelson, B. C., has returned to Murray, Idaho.

W. M. JAMES now has charge of the Lancaster property, Witwatersrand district, South Africa, in what the South African *Mining Journal* calls "banket mining," going deeper in the "reef."

MATTHEW ARNOLD has been appointed superintendent of the foundry and machine shop of the California School of Mechanical Arts. For nearly twenty-five years he was connected with the Union Iron Works.

S. FUGIOKA, "a Japanese mining expert," is at Great Falls, Montana, looking at the smelters. He is making a tour of the United States, examining and studying the methods of treating all kinds of ores in this country.

CHARLES TAYLOR, who has been superintending a mine in the Cable district, Montana, for the past year, has been called to assume the management of a group of mines owned by an English company at Penang in the Malay islands.

W. H. RODDA, a delegate to the Miners' Convention, who was superintendent of the North Star mine here many years ago, and who has recently had charge of the Banner mine, near Oroville, has accepted an offer to go to South Africa.

GENERAL MANAGER KRETTSCHNITT of the S. P. Co. has designated J. A. Fillmore as Manager of the Pacific System of the Southern Pacific, which includes the roads between Ashlaud, Oregon, on the north, Ogden on the east and El Paso on the south. W. G. Curtis is appointed Engineer of Maintenance of Way of the Pacific System and the lines in Oregon.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCTOBER 8, 1895.

547,413.—VALVE—John Bonner, Tiburon, Cal.
547,624.—CULTIVATOR—Jos. Boyd, Concord, Cal.
547,750.—METAL CUTTING MACHINE—M. A. Clenam, S. F.
547,637.—THILL COUPLING—Hugh Gaw, S. F.
547,605.—DUMPING WAGON—G. B. Gay, Crawfordsville, Or.
547,720.—BOOK HOLDER—C. P. Harris, S. F.
547,640.—CONCENTRATOR—J. Jacobs, Henley, Cal.
547,728.—SAFETY GUARD FOR CARS—Libbing & Harris, S. F.
547,564.—CURRENT MOTOR—O. E. Petterson, Contention, Or.
547,617.—TRUCK—J. J. Pratt, Yuba City, Cal.
547,459.—FIRE ESCAPE—F. M. Quinn, Astoria, Or.
547,685.—BRAKE BLOCK—Schilly & Cave, Newcastle, Cal.
547,592.—STATION INDICATOR—W. A. Turner, S. F.
547,585.—FARM GATE—C. Wetzel, Millers, Or.
547,704.—SADDLETREES—C. M. William, Los Angeles, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail for telegraphic order). American and foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

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PURE RUBBER BOOTS

Are the CHEAPEST because

They are the Most Durable.

They have been used by miners for over Twenty Years. Any one who has worn them will tell you how good they are.

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GOODYEAR RUBBER CO.,

R. H. PEASE, Vice-Pres't and Manager.

Nos. 577 and 579 Market St., San Francisco.

Notice of Assessment.

OCCIDENTAL CONSOLIDATED MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the first (1st) day of October, 1895, an assessment (No. 20) of Ten (10c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fourth (4th) day of November, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on MONDAY, the twenty-fifth (25th) day of November, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office Room No. 29, Nevada block, No. 309 Montgomery street, San Francisco, California.

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For information concerning this process for the reduction of ores containing precious metals, and terms of license, apply to

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FOR SALE!

120 Acres in San Diego County,

With one ledge 4 feet quartz and two cross ledges 2 feet; extensions of well known mines. Inquire 1523 Stockton St., San Francisco.

For a number of years THE SETH THOMAS CLOCK CO., of Thomaston Conn., has done a good deal of work for Electrical Companies, and would be glad to increase this line of business. They will make estimates for any article akin to clock work for which a model is furnished and which is wanted in quantities. Add'ess SETH THOMAS CLOCK CO., 19 Maiden Lane, New York.

WANTED.—POSITION AS ASSAYER OR Amalgamator. Capable to take charge of mine and mill. Over 25 years experience.

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ROASTING OF GOLD AND SILVER ORES (Second Edition) and the Extraction of their Respective Metals Without Quicksilver. By GUIDO KUSTEL. M. E.

This rare book on the treatment of gold and silver ore without quicksilver is liberally illustrated and crammed full of facts. It gives short and concise descriptions of various processes and apparatus employed in this country and in Europe and the why and wherefore. It contains 156 pages, embracing illustrations of furnaces, supplements and working apparatus. It is a work of great merit, by an author whose reputation is unsurpassed in his specialty. Price, $3, postpaid. For sale by THE MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA. Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice. There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 4th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	291	5,000	$500 00
M. J. McDonald	455	250	25 00
M. J. McDonald, Trustee	451	2,823	282 30
Paul Lotz, Trustee	435	4,000	100 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	357	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	114	200	20 00
F. J. Sanders	384	88	8 80
F. J. Sanders	385	53	5 30
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	119	31	3 10
A. F. Thane, Trustee	418	1,053	105 30
A. F. Thane, Trustee	419	922	92 20
Chas. E. Anderson, Trustee	407	654	65 40
Chas. E. Anderson, Trustee	408	600	60 00
W. W. Sargeant, Trustee	460	358	35 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	402	100	10 00
H. H. Noble, Trustee	523	4,000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

SONORA EXTENDED MINING CORPORATION. Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice. There are delinquent upon the following described stock, on account of assessment (No. 5) levied on the 23d day of August, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
R. Risdon	75	1,150	$ 29 25
R. Risdon	100	48	1 20
C. T. Morrison	78	450	11 25
C. T. Morrison	79	450	11 25
C. T. Morrison	101	38	95
C. T. Morrison	504	1,000	25 00
George Stant	505	3,500	87 50
Jay Dunlap, Trustee	11	4,000	100 00
E. M. Thompson	111	117	2 92
A. J. Nachtrieb	64	3,385	84 62
A. J. Nachtrieb	89	141	3 52
T. C. Arnold	72	1 880	47 25
T. C. Arnold	103	39	1 95
T. C. Arnold	505	2,000	50 00
G. A. Carter, Trustee	56	3,150	78 75
E. M. Thompson, Trustee	58	1,350	33 75
E. M. Thompson, Trustee	60	1,440	36 00
E. M. Thomdson, Trustee	88	250	6 25
John H. Neale	110	131	3 35
John H. Neale	508	2,000	50 00
L. A. Malson	67	2,610	65 25
L. A. Malson	68	110	2 75
L. A. Malson	107	112	2 80

And in accordance with law and an order from the Board of Directors, made on the 23d day of August, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, No. 213 Jackson street, San Francisco, California, on MONDAY, the 28th day of October, 1895, at the hour of 5 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

ANCHOR COAL AND DEVELOPMENT COMPANY.

NOTICE OF ANNUAL MEETING.

The annual meeting of the shareholders of the Anchor Coal and Development Company will be held at the office of the Company, No. 632 Market Street, Room 5, San Francisco, California, on MONDAY, the 21st day of October, 1895, at 11 o'clock A. M., for the purpose of electing a Board of Directors for the ensuing year and the transaction of such other business as may come before the meeting.

E. D. FARISH, Secretary.

OFFICE.

The shareholders of the Anchor Coal and Development Company will please take notice that the office of the said Company has been removed from 19 Montgomery Street to 632 Market Street, Room 5, as per resolution of the Board of Directors.

MANUFACTURERS OF

Wire Rope, Wire Cloth, Wire Netting,

INSULATED WIRE,

Telegraph Wire, Telephone Wire,

BARB WIRE, WIRE NAILS,

IRON, STEEL, BRASS AND COPPER WIRE.

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Works, Trenton, N. J.

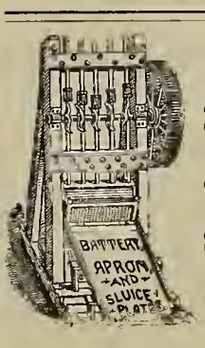
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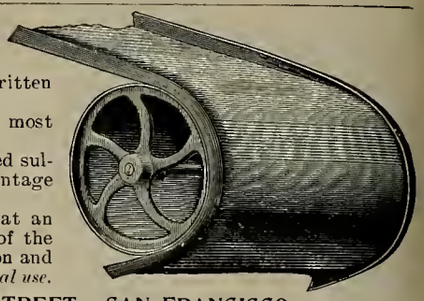
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Every description of work plated. Send for Circular.

THE BLASDEL IMPROVED ORE CONCENTRATING BELT.



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We have been granted two United States patents for improved devices in concentrating belts, the first and most important of which is for a slight riffling of the surface at intervals and crosswise of the face of the belt.

While these riffles are only about one-thirty-second of an inch in depth, they are very effective in saving floured sulphurets and reclaiming quicksilver and amalgam that may escape from the plates, thus gaining a large percentage of values that would go off with the tailings from belts with entirely smooth surfaces.

Our second patent is for an improvement in the flanges which practical mill men will appreciate. They stand at an acute angle inwardly, therefore they thoroughly confine the pulp on the belt; and in passing over the end pulleys of the machine, lie partly down, consequently do not crack or break, as do the old-style flanges; thereby much vexation and loss is avoided. *We keep in San Francisco and New York belts of all lengths and widths suitable for all concentrators in general use.*

BLASDEL CONCENTRATING BELT CO., HAYWARDS BUILDING, 419 CALIFORNIA STREET, SAN FRANCISCO.

RISDON IRON WORKS.

Office and Works: Cor. Beale and Howard Sts., San Francisco.

Cable Address: "RISDON'S" San Francisco.

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Johnston's Concentrator, Improved Bryan Mills,
Risdon Ore Feeders "Challenge Type," Air Compressors,

KNIGHT WATER WHEELS—Highest Efficiency Guaranteed.

MINING, MILLING, PUMPING and HOISTING PLANTS.

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Established 1860. Reliance Works.

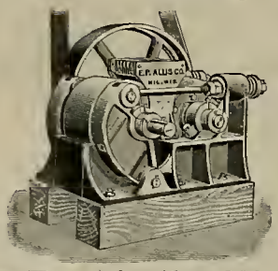
MINING, MILLING AND SMELTING MACHINERY.

Crushers, Rolls, Jigs, Concentrators, Screens, Stamps, Pumps, Compressors, Hoists, Boilers, Etc., Etc.

Reynolds Corliss Engines.

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Salt Lake City, Utah ..... 73 So. Main Street.
Denver, Col. ..... 427 Seventeenth Street.
Minneapolis, Minn. ..... 416 Corn Exchange.
Chicago, Ill. ..... 509 Home Ins. Building.
Kansas City, Mo. ..... 43 Armour Building.
Pittsburgh, Pa. ..... German National Bank Building.
New York City ..... 26 Cortlandt Street.
City of Mexico ..... Calle Gante, No. 12.

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21 and 23 Fremont Street, - - - - - - San Francisco, Cal.

MINING AND SCIENTIFIC PRESS.
AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 17. SAN FRANCISCO, SATURDAY, OCTOBER 26, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Steel Frame Stamp Battery.

Among other requirements of South African mining machinery is the absence of wooden framings or fittings, by reason of the climate and the unceasing activity of insects. The teredo in our waters is not more destructive to piles than certain forms of insect life to wooden framings.

The accompanying illustration is of a 20-stamp battery, built in England for a South African mine. It is not wholly of iron, but nearly so.

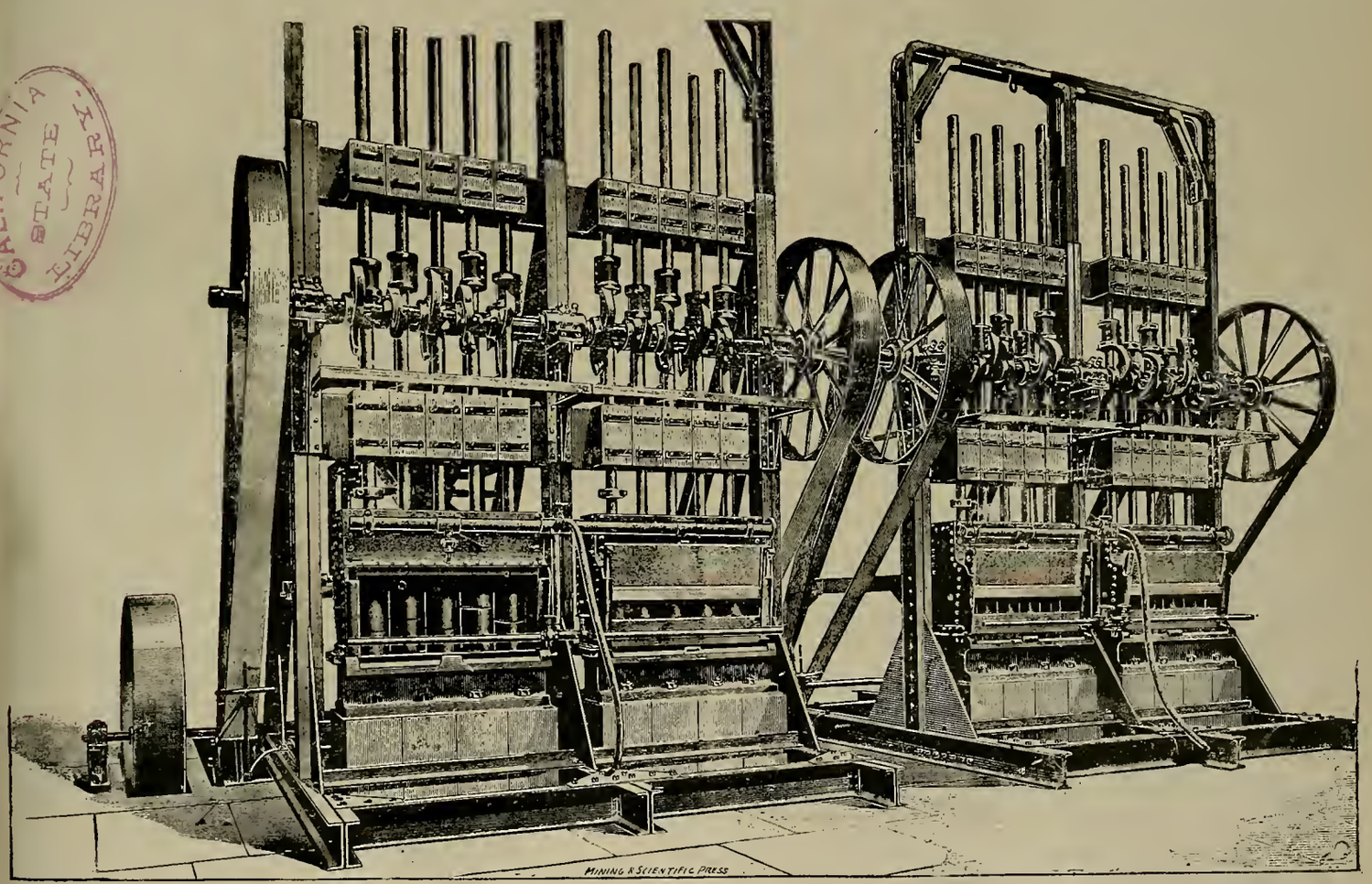
The joints are planed and fitted, with the holes drilled in position. The battery was first erected complete at the works, and all the parts marked and photographed, making its re-erection at the mine an easy matter. It is made in sections of 250 pounds, where transportation is difficult and costly, or in sections of 30 cwt., as desired. The bolts are fitted with lock nuts, and rivets are supplied for riveting up at the main when required. The battery is arranged in sections of two of ten heads each, having five heads in one mortar box, each five heads being driven by an independent steel pulley, so that any section can be stopped without the others. It will be noted that the construction and operation is different in some respects from our California stamp mill.

The countershaft is of steel, fitted with bearings, with gun metal steps, lubricators, pulleys for driving the stamps, couplings, and loose collars fitted with steel set screws, and main driving pulley for receiving power from the engine or turbine, of steel, fitted with key and keyway. The cam shafts are of steel, each fitted with five steel cams, having lifts from six inches to twelve inches as required. The cam shaft bearings are fitted with oil catchers, gun metal steps and lubricators. The stems are of wrought iron, each tapered to enable them to be reversed. Each stem is fitted with a chrome steel tappet fitted with three keys. They are faced on the top and bottom sides, so as to be reversed when worn. The shoes are of chrome steel, with heads bored out so that either end will fit the stem and the shank of the shoe, suitable slot holes being provided so that the stamp and shoe can be removed; the whole design gives a falling weight of 850 pounds. Each head of stamps is fitted with fingers for propping up.

The motor boxes are made whole or in two parts, or in sections of 250 pounds as required. The boxes shown in the illustration are in two parts, the lower parts being of cast iron and the upper part of wrought steel, fitted together with planed joints, and through bolt holes and lock nuts. Each box is fitted with five steel dies, with hexagons on the lower edge to prevent turning in the box. If desired, the top part of the motor box can be made of steel plates, having an interual lining, and fitted complete with water-distributing pipes, and arranged to receive amalgamated copper plates when required. The grate frames are fitted with chock blocks and thick amalgamated copper plate, whereby the depth of discharge can be altered at will. Hose pipes and cocks are supplied for washing out and cleaning the launders. The launders are supplied complete with arrangements for altering the angle of the launders, and each set of five heads has an independent amalgamated copper plate surface of large area, and fitted with a frame for supporting the launders clear of the battery framing. Australian mercury wells are fitted at the end of each launder, and the outlets arranged to convey the tailings over blankets or settlers as may be required.

The automatic feeders can be constructed of wood or wrought iron framing. A runner and hook with framing are provided to lift the stamps, etc. The sizes of battery usually supplied are 650, 760, 850, 900 and 1000 pounds, having a maximum fall of twelve inches at ninety blows per minute.

A California stamp mill, built of steel and iron throughout, with not a particle of wood in its composition or framing, will form the subject of a subsequent illustration, the second being interesting by contrast and comparison.



STEEL FRAME STAMP BATTERY.

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J. F. HALLORAN.....General Manager

San Francisco, October 26, 1895.

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THE British Department of Mines and Mineral Statistics has issued a hulky volume containing a list of the mines and mine owners of Great Britain. Fame awaits the man or official department that issues a similar list for this country—or even State.

SINCE '85 the Broken Hill, Australia, silver mine has yielded 71,616,192 ounces fine silver, an important factor in the world's silver output. The rich carbonate ores are reported to be almost exhausted; great quantities of sulphides remain, with lessening possibilities of profit.

THE reported sale of 300,000 shares of the Anaconda, Montana, mine is confirmed by the California owners of that property. The transaction was completed last Tuesday. The amount paid is $7,500,000. The control of the mine remains in the hands of the American owners.

THE price of silver is of as much importance to the stockholders of the several railroads of the country as to the producers of the white metal. It makes all the difference between dividends and depreciation. Every railroad traversing the silver mining districts has gone into the hands of a receiver. With silver at anything like its old-time figures those railroads would be dividend-paying. And the railroads form but one branch of the business of the country similarly crippled by the present silver status.

AN important suit—important to publishers—is now on trial in New York. The Ingraham Interlining Co. sues *Vogue* for $10,000 damages for declining to publish that company's advertisement. Advertising experts say the company has a good case. This paper thinks the company has no case at all. It is hardly possible that any judge or jury would seriously entertain the issue. It is of some local importance. The MINING AND SCIENTIFIC PRESS weekly declines proffered business from parties whose patronage is not deemed desirable, and is interested in knowing if similar action in New York is legally obnoxious.

THE most pressing present work before the California State Miners' Association is that in hand by the Legislative Committee. Its report, which was unanimously endorsed by the convention last week, was an important one, outlining the purposes and policy of the association in regard to hydraulic mining and showing what had been done. The two bills already drafted for congressional action are worthy of the indorsement they have received and will need careful attention. A third bill to be introduced in Congress is now in process of preparation, applies to the segregation of mineral lands, being the framework of a California classification similar in outline to the Montana bill passed in the 53rd Congress. That act was shorn of some of its value by failure to provide that the commissioners appointed under its provisions shall be residents of the State—a mistake that will not be repeated in the bill for a similar commission for California to be introduced next December in the National Legislature.

WHETHER in ignorance or defiance of the fact, it is a fact that the Anti-Debris Association and a few subservient valley newspapers are hurting their region and doing the entire State an injury by opposing the plans of the U. S. Debris Commission to reclaim the Yuba and Feather river channels. That the railroad corporations oppose it is to be expected; revenge for the attitude of the California Miners' Association on the mineral land question is second only to the impulse that seeks to check any probable means of transportation competition. That is open and understood, and the opposition of the Sacramento newspapers is explainable. Less easily understood is the action of some of the valley press and the executive committee of the Anti-Debris Association now doing its best or worst to hinder the only measure affording promise of protection or prosperity. In one column they bewail the blight that has fallen on the local market and in the next one attack the men who can alone remove it and decry the industry that has always furnished the valley producers their best cash customers. Apart from any broad feeling of justice, equity or State pride, the present attitude of those referred to is opposite to the plainest dictates of business interests.

THE Collector of Customs at the port of New York has recently addressed an inquiry to the Secretary of the Treasury in which he stated that large quantities of sulphide of silver have been received at that warehouse during the month of July last and subsequent months and asks whether or not duty should be charged in the lead contained in such sulphide of silver, and, if so, upon what basis it should be assessed, or what percentage of allowance should be made. With the inquiry were submitted four average samples of twelve entries, with the percentage marked thereon, as returned by the United States Assay Office, and a statement was made to the effect that the lead contained in this sulphide of silver is lost in the slag and goes off in the fumes and is therefore not extracted or recoverable. The percentage of lead in the samples submitted varied from .68 to .63 of one per cent, and the solicitor of the Treasury, to whom the question was submitted, has advised the Department to the effect that the small quantity of lead found in these samples is not subject to a separate duty under the provisions of paragraph 165 of the Tariff Act of August 28, 1894, which reads as follows: "Lead ore and lead dross, three-fourths of one cent per pound, provided that silver ore and all other ores containing lead shall pay a duty of three-fourths of one cent per pound on the lead contained therein, according to sample and assay at the port of entry, the method of sampling and assaying to be that usually adopted for commercial purposes by public sampling works in the United States." The Collectors of the ports will govern themselves accordingly.

MENTION was made in last week's issue of the necessary procedure where assessment work is done on one of a group of claims for joint benefit. Report of a case in point comes from Helena, Montana, where an application had been made for patent to five claims. The deputy mineral surveyor made report, showing that more than $15,000 worth of work had been done on one, but that the improvements upon the other four did not aggregate $500 on each lode. The Department returned the application for further proof, accompanied with the following communication from the Commissioner of the General Land Office: "On file with the case is the affidavit of claimant to the effect that the improvements upon the Easton lode tend to develop all the locations embraced in the entry. The evidence that the improvements upon one claim tend to develop other locations must be in the form of a certificate from the United States Surveyor-General to that effect, and claimant will, therefore, be required to furnish a certificate from the United States Surveyor-General of Montana, showing how the improvements on the Easton lode tend to develop the other claims embraced in this entry. The evidence of the use of occupancy of the Apex and Bonauza millsites consists of affidavits to the effect that they are used in connection with the Apex and Bonanza lode claims and that the improvements thereon consist of a house upon each millsite. Claimaut will be required to furnish additional evidence of the nature and extent of such use or occupancy. Notify claimant hereof, and that he will be allowed 60 days from notice within which to furnish said evidence, in default of which, or of appeal, the entry will be cancelled to the extent of the Apex, American, Bonanza, Easy Street and Easton Fraction lodes and the Apex and Bonanza millsites without further notice from this office."

INQUIRY is made regarding the manner in which the required amount of annual assessment work on unpatented mining claims is estimated, whether by the day's work or foot in shaft or tunnel; if by the day's work at what price, or if by the foot what price; and if work on necessary roads or trails can be counted as assessment work; also if allowance can be made for time traveling to and from the claims. The inquiries come from three different sections of the State—Shasta, Mariposa and Los Angeles. The work is estimated by the day's work at the ruling local rate. While the department rulings are uniformly favorable, showing a desire to interpret the statute according to its spirit, so far as is known by this paper no decision permits trail or road work to apply on the required amount of annual work or improvement. Work must be on the claim itself, or, if on other ground, with direct relation to it. No allowance is made for time or expense going to or returning from the claim. In this matter of assessment work, the attention of holders of unpatented mining claims in this State is directed to an act passed by the California Legislature March 31, '91, which prescribes that when the required amount of annual labor or improvements is put on an unpatented mining claim the owuer shall within thirty days file with the county recorder an affidavit describing the labor performed, the improvement made, and its value. The act provides that failure so to do renders the mine open to relocation.

IF the telegraphed figures of the Denver drilling contest last Saturday are correct, the Colorado miners beat the record. At the '93 contest D. L. Jones won the single-hand record, sinking a hole eighteen and eleven-thirty-sixths inches deep in fifteen minutes; Page and Reagan of Butte City, Montana, held the double-team record, drilling twenty-nine and fifteen-sixteenths inches in that time. Those records were broken at the first rock-drilling contest on this coast, held at the Midwinter Fair grounds on "Miners Day," May 21st, 1894, when E. F. Durham of Grass Valley took first prize and the world's championship, drilling a hole nineteen and thirty-one-thirty-seconds inches through the hardest Rocklin granite in fifteen minutes. T. J. Ahearn of Grass Valley also broke the record and took second money, drilling nineteen and nine-sixteenths inches. On the same day, in the double-team drilling, John Kitto and Sam Harvey beat the record and took first prize, putting in a hole thirty and twenty-one-thirty-seconds inches in fifteen minutes. In last Saturday's drilling contest at Denver these figures were beaten by three double teams from Leadville, drilling through Gunnison granite, the scores being thirty-five and five-sixteenths inches for Sullivan and O'Neil, thirty-four and thirteen-sixteenths inches for Stewart and Lingenbohm and thirty-four and eight-sixteenths inches for Regan and Dwyer. In the single-handed test five beat the record of nineteen and thirty-one-thirty-seconds inches made by E. F. Durham of Grass Valley, the scores being twenty-two and thirteen-sixteenths inches for Jones, twenty-one and eleven-sixteenths inches for McCutcheon, twenty and twelve-sixteenths inches for Bowen, twenty and seven-sixteenths inches for Sapp and twenty and one-sixteenth inches for Taylor.

Concentrates.

THE Northwest Mining Association now has a membership of nearly 500.

THE mill at the South Eureka, Sutter district, Amador Co., has resumed operations.

THE Crown Point Mining Co., capital stock $1,000,000, has incorporated at Park City, Utah.

THE *Argus* reports gravel that goes $100 to the car struck in the Gray Eagle tunnel, Placer Co.

THE Kamloops Mining and Development Company have transferred their plunt to Rossland, B. C.

BAILEY, PORTER AND THOMAS have bought the Briggs gold property near Riverside, Cal., and will develop it.

THE Alaska-Mexican Mining Company has declared a dividend of 15c per share, $30,000 payable next Monday.

NEARLY 1000 men are now working on smelter, road and mine for the Iron Mountain Mining Co. near Redding.

THE Tacoma Smelting and Refining Co. reports having shipped during September 287,237 pounds of bullion, valued at $48,412.27.

THE Alaska-Treadwell Mining Company will pay its regular quarterly dividend of 37½c per share, amounting to $75,000, next Monday.

IN '94 Butte, Mont., produced 51.6 per cent of the total copper product of the United States, and 26 per cent of the world's total output.

THE *Arizona Miner* says the extent of work done on the Congress mine amounts to about twenty-six miles of openings—shafts, drifts and tunnels.

FROM the Bonanza mine, near Baker City, Or., the superintendent brought to Baker City last week $4500 in gold bullion, the result of twenty days' run.

IN Sutter district, Amador Co., the Mahoney and Wildman mines have been connected by a tunnel. Twenty stamps are to be added to the Mahoney mill.

THE Champion mine in Nevada Co. is reported bonded to a French Company, for $1,250,000, $5,000 per month to be paid till Feb. 1st '96, when the option expires.

EVERY vessel heading for South Africa now has on board a California miner going under contract to take charge of some gold property at a handsome annual salary.

THE Shasta *Democrat* says there is strong probability of a deal being made by which the Bloss & McCleary gravel mine, near Trinity Center, will be sold to St. Louis capitalists.

OREGON expects to make a good gold showing in '95. For the calendar year 1893 the gold product of Oregon, as estimated by the director of the mint, was 79,592 fine ounces.

THE output of the Witwatersrand, South Africa, district for the month of August has been declared by the Chamber of Mines at 293,573 ounces, the highest monthly total yet reached.

THE Nevada Co. mining suit of Walrath vs. the Champion Mining Co., previously reported in full in these columns, is now being argued in the U. S. Circuit Court of Appeals in this city.

THE Mineral King, a silver mine twelve miles from West Point, Calaveras Co., has been placed on the London market; negotiations for a sale are pending. The price asked is $100,000.

THE Baker City, Or., *Democrat* says the Columbian mine in the Virtue district is being put in shape for a stamp mill to be put on the property in the near future. W. O. Reynolds has been engaged as foreman.

A CLEVELAND, O., COMPANY is putting up a 10-stamp mill to work a gold property situated on the west side of Smoky valley, forty-eight miles south of Austin, Nevada. The mill is to start up by January 1st, '96.

CHIEF-JUSTICE FULLER of the U. S. Supreme Court announces that the cases involving the Wright irrigation law of this State, affecting the validity of $20,000,000 of bonds, are set for the first Monday in January, '96.

DURING September the Alaska-Treadwell shipped bullion to the amount of $80,250; ore milled, 22,849 tons; sulphurets treated, 403 tons; bullion which came from sulphurets, $24,255; gross expenses for month, $22,583.

A VANCOUVER, B. C., correspondent reports the results of a clean-up at the Cariboo hydraulic mine to be $41,857 gold for twenty-nine and one-half days' work, and $26,125 for the clean-up at the Horsefly hydraulic mine.

THE Mineral act of British Columbia has been amended so as to give the owner of a mineral claim title to all minerals within the boundary lines of his claim continued vertically downward, thus stopping a fruitful source of litigation.

THE Laramie *Boomerang* says George Kipp and associates, the new owners of the Holy Terror mine, were recently offered $300,000 for the property by New York parties, who wanted an option for thirty days. The proposition was declined.

THE Troy Mining, Power and Improvement Company has incorporated at Spokane, Wash.; capital stock, $100,000; incorporators, R. Russell, F. K. McBroom and W. J. C. Wakefield of Spokane, E. L. Preston of Troy and C. D. Potter of Wallace, Idaho.

SUPERINTENDENT DUFFIELD of the Coast and Geodetic Survey says there is no longer any doubt that all of the Yukon river basin below the mouth of Forty-Mile creek is American territory, which includes the gold fields of that stream as far as opened.

P. WYBERG is one Yukon, Alaska miner who feels that his efforts have not been wholly in vain. He returned this week with nearly $45,000, the result of two years work on Forty-mile Creek. Those there now will freeze up with the country till next spring.

THE United States Court of Appeals at St. Louis has affirmed the decision of the United States Circuit Court in the case of Fullerton vs. The Homestake Mining Company. Fullerton got judgment for $23,000 and the case was appealed by the defendant.

THE Clara Gold Mining Company has incorporated here; capital stock $500,000. The following amounts are subscribed: F. H. Coy, H. Harris, Grizzly Flat, El Dorado county, $150,000 each; E. E. Simpson, San Jose, $1000; C. M. Cross, W. M. Abbott of this city, $500 each.

THE Alaska *News* says the recent discoveries on Douglas island will stimulate prospecting in that neighborhood to an even greater extent than ever before. With the addition to the Mexican plant and other mills to be built, 500 stamps will be in operation in a year.

THE Orinoco Company, the syndicate of United States capitalists which has secured concessions on the Venezuelan gold lands claimed by Great Britain, is preparing to send a large force of prospectors, miners and workmen into the field. W. N. Safford represents the company in New York.

J. P. CLARK AND F. J. COOK have sold the Oro Fino mine at Meadow Lake to Chicago and Colorado men for $20,000. The purchasers propose putting up a sawmill to get out lumber enough for a mill, hoisting works and other buildings before the heavy snows set in, and next spring buy a complete plant.

THE *Union* says Robert McMurray, who purchased the Tip Top and West Harmony mines, has changed the name to Delawnre, and both mines will go by the one name. Superintendent Gassuway is making good headway with the incline, being down about 75 feet of the 118 feet that he expects to sink.

THE Supreme Court of Utah holds that a locator of a quartz claim, who has allowed his location to lapse and become subject to relocation, under the statutes providing for the relocation of claims on which the required annual work has not been done has the right to make a new location, covering the same ground.

FANCY PRICES for prospect holes or mines with shafts from 10 to 50 feet deep is responsible for the limited amount of working mines, says the Butte *Inter-Mountain*. An undeveloped mining claim is like an undeveloped farm, and much money has to be expended before it becomes productive. Extravagant prices scare out capital.

LAST week's incorporations at Cripple Creek, Colo., were: The Manhattan Consolidated G. M. Co., capital stock $1,250,000; the Mountain Beauty G. M. Co., capital stock $2,000,000; the Saddle Mountain G. M. Co., capital stock $1,250,000; Atlantic & Pacific Mining and Milling Co., capital stock, $1,000,000; Tenderfoot Leasing and Mining Co., capital stock $1,000,000.

THE Homestake, B. C., mine has not been sold. The English syndicate offered a cash payment of $1800 to reimburse for wages paid; to assume the bond; pay an advance of $5000 on the property and develop the property on condition of the delivery of 51 per cent of the stock of the company. This offer the owners refused to entertain, but have submitted their ultimatum to F. Bernard, of Victoria.

THE Diamond-R Mining Company, of Great Falls, Montana, has sold its stock of silver, amounting to 170,000 ounces. It has been holding the silver in New York for a year and a half past, waiting for better prices than have recently been quoted. The price which was finally obtained is said to be 66.95 cents. The company figures that it made a little more than interest on its money by holding the silver till this time.

THE Independence mine, at Cripple Creek, Colorado, is owned by W. S. Stratton. During the first four months of this year it is stated the mine produced more than $650,000, and prior to January 1, 1895, the output, while the mine was being opened up, exceeded $1,500,000. A Colorado authority estimates that there are gold reserves blocked out of $2,500,000 and development in different directions is adding daily to this total.

GEORGE CHRIST of Nogales, Arizona, gives a copper item that goes to show how the money kings of the East are interested. He states that J. D. Rockefeller, the Standard oil magnate, has an agent out looking for copper property. The man went to Sonora. While in the latter State he bargained for a piece of property and telegraphed for the money. In less than twenty-four hours the money had been paid and the business done.

THE following is from the New York *Financial News*, where it is gravely given place in its mining column: "An old California miner found himself broke in the city of New York. Hearing of the Kaffir craze he made his way to London, organized a syndicate of forty old Californians, went to the South African gold fields and commenced—not mining, but promoting, and is now worth £1,000,000, spending about one-half his time in London placing his stock, the rest of the year in Africa working up prospects."

IN the past year mining activity has increased in Mexico. It is all silver mining except on the Pacific side of the country. The greatest activity has been in the State of Zacatecas, which, being on the main line of the Mexican Central road, gives that section greater facilities for marketing its ores than any other section possesses. The most money has been made in mining in that State and the State of Hidalgo. It is very different there from what it is with the people of gold countries. The silver is just as valuable to Mexicans or others, so long as they remain in Mexico, as gold relatively is to residents of the United States. They can buy just as much with it as they ever could, and such things as are imported from gold countries are sold cheaper because of competition.

THE South African Mining Department summarizes as follows operations in the Witwatersrand district for the three months ending June 30, '95: Metres driven, 25,031; metres sunk, 10,399; tons extracted, 963,747; tons milled, 859,371; tons per stamp per day, 4.033; concentrates produced, tons, 9372; concentrates treated, tons, 8818; assay value, ounces, 2.779; tailings treated, tons, 712,057; assay value, ounces, 0.241; whites employed, 6231; colored employed, 45,782; mill yield, ounces, 375,087; mill yield per ton, ounces, 0.436: value, £1,351,971; value per ton, 31s 6d; concentrates yield, ounces, 27,159; concentrates assay, per ton, 3.080; concentrates value, per ton, 224s 8d; tailings, ounces, 158,587; tailings per ton, ounces, 0.223; tailings, value, £486,214; tailings, value per ton, 13s 8c; total production of the Witwatersraud, ounces, 560,833; value, £1,937,255.

F. M. DICKENSON, secretary of the Broken Hill Proprietary Co., Port Pirie, Australia, writes from Melbourne to the *West Coast Lumberman* that the annual consumption of lumber in the mines of that company is 15,000,000 feet. The first fir lumber sent from this coast was in 1889. Mr. Dickenson says that it has not been in use long enough to enable an opinion to be formed on its durability; it therefore shows no age defects in the six years' test it has been put to. As fast as the timber becomes unnecessary in a mine it is removed and used elsewhere. The largest single order ever placed for fir was for 10,000,000 feet. The Australian mines take a wide range in timbers, running up to sticks so large that they could only be cut on the Pacific coast. The St. Paul & Tacoma Lumber Company of Tacoma, Wash., is now loading some 18x18 and 20x20—80 feet for Port Pirie.

AFTER all the rumors and denials, it is finally announced that a deal for 300,000 shares of the Anaconda copper mine has been definitely concluded. The new European buyers will have two directors in the board. The purchase is made by Kuhn, Loeb & Co., representing a syndicate consisting of themselves, the Rothschilds, Messrs. Cassel, Wernher, Bell & Co., and the Exploration Company of London, who have placed the stock in London at $30 a share. The par value of the stock is $25 a share. The mine has been owned by the estate of its discoverer, the late Senator Hearst of this State, J. B. Haggin and his partner, Mr. Tevis, and Marcus Daly, who is in charge of the operation of the mine. Michael A. Hickey, who discovered the copper mine in 1866, thought so little of his discovery that he failed to locate it until 1876. He subsequently sold it for $40,000.

A SUIT just brought in the Circuit Court of the United States for the Colorado district is a matter of great importance to mining men and ore handlers in general. It is entitled Guillermo H. Clark and Frank N. Clark against the Omaha & Grant Smelting Co., and involves not only the question of smelter charges and tolls, but the basis of their computation. Guillermo H. Clark of Culiacan, Sinaloa, Mexico, and Frank N. Clark of Omaha are associated in the business of buying ore under the name of G. H. Clark. In this line several shipments of ore were made to Omaha during 1894 and 1895 for treatment at the Omaha smelter. This ore was subject to the fluctuations of the silver market and on the assay value of the ore. In the pleadings in the case the plaintiffs aver for one cause of action that a certain shipment of ore in January, 1894, was handled by the Omaha smelter and returns were made for 11,259.66 ounces of silver, resulting from reduction, at the rate of 59.5 cents per ounce; whereas, on the day the silver was bought the actual value of the silver was 63.43 cents per ounce, a difference of 3.93 cents, which, the plaintiffs aver, the defendant company appropriated to its own use. In addition to importance to miners this case is one of much moment. It is the first of the kind ever presented to court, and its results will determine a precedent. Custom smelting is still carried on much as grist milling was in days gone by, and the irrepressible conflict as to tolls is as fierce as ever.

AT the annual meeting last Monday of the Con. Cal. & Va. M. Co. Messrs. Fox and Sieberst, each owners of one share of the company's stock, made technical objection to the election of a board of directors, on the ground that the shares represented did not appear on the company's books in the names of of the real owners. The old board was re-elected, with the exception of J. W. Twiggs in place of Con. O'Connor and T. H. Fish in place of G. R. Wells. The law upon which the dissenters base their claim is "an act for the further protection of stockholders in mining companies," approved April 23, 1880, as applies to the books of mining companies and elections held thereunder: Sec. 2. All stock in each and every mining corporation in this State shall stand in the books of said company in all cases in the names of the real owners of such stock or in the name of the trustees of such real owners; but in every case where such stock shall stand in the name of a trustee the party for whom he holds such stock in trust shall be designated upon such books and also in the body of the certificate of such stock. Sec. 3. It shall not be lawful for any such corporation, or the secretary thereof, to close the books of said corporation more than two days prior to the day of any election. At such election the stock of said corporation shall be voted by the bona fide owners thereof, as shown by the books of said corporation, unless the certificate of stock, duly indorsed, be produced at such election, in which case said certificates shall be deemed the highest evidence of ownership, and the holder thereof shall be entitled to vote the same.

OF the present London, Paris and German speculation in South African mining shares, Chauncey Depew, back from England, says: "There is one odd thing in connection with it, and that is the fact that no American money is going into this mad stock speculation. While I was abroad I had pointed out to me several men who had made at least ten millions of dollars apiece by this form of speculation in South African mines. The speculation there is much the same that it was in this country when the Leadville mines were being opened up. Why, men told me there that they feared to issue another dividend lest the stock should go up higher, and they would have so much money in their vaults that they would hardly know what to do. The matter is explained from the fact that there is a plethora of money in Europe just now, owing to hoarding and calling in on account of hard times. This money must have an outlet somewhere. The South African gold mines have proved to be rich beyond the ordinary, and they have been seized upon as the best known means of speculation. Every one trying to get in has sent the stocks kiting, and they are bound to come down like the proverbial sticks, leaving in the wake a lot of wrecks. The methods being followed abroad are exactly like those common during our own excitement. During the height of the Leadville craze a new mine was put on the market every day or so. The stock was watered and the money poured in. When the bubble burst, thousands were bankrupt. That is the way that it will be in England. I know of a case in this country which took place during the Leadville excitement. A man had a mine and he thought it was worthy of development. He came to New York and formed a stock company which was capitalized at $1,000,000. He sold his shares at $10 apiece. He disposed of all his stock, and was $1,000,000 ahead. His stock kept creeping up above par. It got to $15 and then to $20. The mine was richer than he thought. He watched it climb, and then came to the conclusion that it was worth more than he had given it credit for. He decided to get it back, and so he began to rebuy. He expended his entire million and another $500,000 that he had. He finally got the mine back; and just as he did, the bubble burst, and the shares went tottering. After the debris was cleared away, he found that it had cost him just $500,000 to put his mine on the market. That is the way that it is abroad. The craze is on, but it will all tumble, and Europe will stagger under the shock. It is a tribute to American acumen that we are not investing a dollar in the mad rush."

The Sampling and Measurement of Ore Bodies in Mine Examinations.

NUMBER I.

By EDMUND B. KIRBY.

Investors who contemplate the purchase of mining property, or who have to decide some question of business policy concerning property they already own, are frequently unable to judge of such enterprises or lack the time to investigate for themselves. It is then customary to call in the aid of some experienced mining engineer, in whose judgment and integrity absolute reliance is placed. Such men, who make a specialty of mine examinations, now constitute a large class of the engineering profession, and are commonly known as "mining experts."

The work is peculiar in that the engineer is generally called upon, not merely for his opinion on technical points, but as the judge of the investment. This makes the responsibility unusually heavy, since his decision is generally accepted as final, and the amounts involved are large.

The examination of a mining property necessitates an inquiry into everything that bears upon its value as an investment. Among the principal facts to be determined are the net value of ore already discovered, the chances indicated for further discoveries, the best metallurgical treatment and the past record of the property. Estimates are required of operating expenses, costs of development, equipment, etc., together with the profit to be expected. The price and terms of payment, the working capital needed, and the time required for its recovery, the question of title, the risks from litigation, flooding and other accidents, also enter the problem.

After these and all other pertinent facts have been carefully determined and arranged clearly before the mind, the main question at issue, of investment or policy, is decided by that business judgment which comes only from experience and knows no set rules or formulæ.

It is the object of this paper to discuss only one part of the work thus outlined—the valuation of discovered ore by sampling and measurement. This has little or no importance in some cases, either because no ore has yet been found, or its quantity is small, or other matters are sufficient to decide the question of investment. In other mines the amount of discovered ore is one of the chief considerations, and requires an accurate estimate. This is a difficult and laborious undertaking, often calling for every resource of technical skill. But little has been published upon the subject in professional literature, and every engineer has selected or evolved his own methods, generally with little knowledge of or reference to those of others. It is therefore intended to describe the methods which the writer has found most effective, in the hope that others engaged in the same field may also contribute to this important subject.

It is desirable to first define the exact sense in which the following terms will be used in this article:

Ore shoots are those portions of an ore deposit where the ore bodies are so frequent, or so grouped, that partial boundaries of some definite shape and direction may be drawn around them, and such specially productive portions thus distinguished from the rest. The term is also applied to a single ore body which has considerable extension in one direction.

An *ore body* is, in general, a solid and fairly continuous mass of ore, which may include low-grade and waste as well as pay ore, but is individualized by form or character from adjoining parts of the deposit.

Pay ore includes those parts of the ore body which are both rich enough and large enough to stope with profit.

In order that the facts may be clearly presented to the mind, the discovered ore is separated into two classes—*ore in sight* and *probable ore*.

"*Ore in sight*" is that contained in blocked portions of the deposit, each of which is so clearly exposed (by sections on several sides) that the limits, continuity and value of its contents may be determined, and relied upon with reasonable certainty. Such ore is thus a proven resource, ready for extraction, and is expressed in terms of net profit.

"*Probable ore*" is a more elastic term, and includes any blocked ore not certain enough to be "in sight," and all ore which is exposed for sampling, but whose limits and continuity have not been proved by blocking. It may also include any undiscovered ore which, from the evidence, is too strongly probable to be classed under the heading "chances indicated." Probable ore may be estimated in several distinct divisions, and the relative degree of probability assigned to each.

In practice the ore shoots and bodies of a deposit, themselves irregular in form, are found penetrated by every conceivable arrangement of mine workings, from orderly shafts and levels to the "corkscrew rat-holes" of the prospector or lessee. Thus every mine presents its own special problems.

The work of sampling and measuring both classes of ore is carried on at the same time and by the same methods. It is intended to estimate only the pay ore; and since its practical limits are those which will afterwards be defined by the actual stopes, it becomes necessary to ascertain what the shape and extent of these excavations will be, and measure only the ore within their limits.

In order to secure working room, the dimensions of the stopes will often be greater than those of the pay ore, and will thus also include barren rock and non-profitable ore. No attention is paid to these worthless portions if they can be kept separate in breaking. If, however, ore streaks and waste are so intermingled that it will be necessary to break them down together and sort out the richer portions afterwards, the measurements and samples are then made on the entire average mass as it stands.

(*To be Continued.*)

Reasonable Geology.

NUMBER II.

By FREDERICK DANVERS POWER, F. G. S.

There are many other instances that might be mentioned—for example, "mundic" may be either iron pyrites or mispickel. Topaz may mean a mineral that rightly owns the name—a yellow crystalline variety of corundum known as Oriental topaz, or a yellow quartz crystal called false topaz. Ashestos may be a variety of hornblende, to which the name was originally given, or a variety of serpentine.

Miners often object to what they call long scientific words because they don't understand them. It is not, however, the length of the words so much as the confusion in the mind of the miner as to the exact meaning of the words that frightens him, because he is more accustomed to use his provincialisms rather than well selected words more suited for general practice in these days when miners travel about in different countries. Moreover, he frequently makes use of scientific words in his daily occupation, though probably he is not aware of it. When speaking of "pyrites," he little thinks it is derived from a Greek word meaning fire, given to it on account of the spark it emits when struck by steel; a phenomenon he observes every day, though perhaps it never enters his head to enquire the reason why. Sometimes confusion arises between the use of a term in its collective sense and special meaning. To again make use of our old friend pyrites as an example; it may be used as a family name for certain sulphides, *e. g.*, iron pyrites, copper pyrites, arsenical pyrites magnetic pyrites, tin pyrites, etc. or as a special name for one particular mineral, viz. iron pyrites.

There are few causes that have thrown so much discredit on theories applied to geological subjects as fallacious reasoning. We hear of arguments that simply bristle with logical fallacies, and are a cause of offence to our very instincts. Some argue from a special case to a general one, or *vice versa;* others assert a conclusion that has no connection with the proposition from which they argue; or assume one thing is the cause of another, without sufficient proof; in fact, the modes of reasoning which deceive are numerous, and their application various.

Reasoning gives us knowledge, and the best way to prepare ourselves for increasing such knowledge is to study our subject long and carefully from all sides; in other words, to saturate ourselves with it. The study of a subject, however, involves a knowledge of others; so, before we are in a position to argue thoroughly we must make ourselves masters of allied sciences. Intelligent and careful observation is the foundation of logical sequence, and it is by no means easy, even for the most honest observer, to prevent his wishes or opinions from coloring the true facts, by unconsciously placing too much stress on a favorite subject, and thus distorting facts by an unbalanced line of thought.

Certain phenomena which have been carefully studied and classified are reduced down to systems, which, for the sake of convenience we term "Laws of Nature." These laws are constant, and may be relied upon. Sometimes, however, it appears as if they did not always act when they should, but on investigation we find that one law has been temporarily modified by another. Take, for instance, gravity. The earth attracts bodies towards its center, but during volcanic eruptions we see bombs hurled up in spite of gravity, and still that universal force is acting all the time, and prevents the bombs from going as high as they otherwise would, and eventually, with the assistance of the friction of air, overcomes the transient superior force developed by the sudden expansion of gases, and the bombs fall to the ground. Here they come to rest for the time being, but the force of gravity is ready to drag them lower, if only their support were removed, and will also resist the efforts of those who attempt to raise them off the earth.

We may accept certain truths at once as axioms to assist us in our arguments, such as that there is no effect without a cause; that matter is never annihilated, but is simply altered or transplanted, etc. Phenomena occurring at the present day in connection with rock building are due to the same laws of nature that laid down similar deposits in ancient times; we remember, however, that conditions were not the same in degree as they are now. The first waters condensed were warmer than our oceans of the present day, and would, with their dissolved salts have a more powerful chemical action than the diluted cooler seas; also the terrestrial heat, overpowering the present effects of the solar heat, would nullify what we call seasons, and the want of these would in turn affect the formation of deposits, such as niter, that are to be found in arid districts.

There are two classes of reasoning known as Inductive and Deductive; they may be employed singly or combined, in order to get at the truth of matters. By inductive reasoning we first find out by observation, with the help of our senses, what is true of many different things; we then try, by proper reasoning to discover the laws which govern them by forming hypotheses. We must draw our conclusions, and finally verify them.

By deductive reasoning we do just the reverse; we find out what will happen in consequence of a so-called law of nature, if something else is true.

Unfortunately, life is not long enough for each person to observe and test everything for himself; we are, therefore, obliged to accept the work and conclusions of others, in many cases; but in doing so we cannot be too careful in the selection of the individuals whose results we accept, and should be satisfied that they are careful experimenters and observers, free from bias, and sound in their arguments. It is not necessary to see a thing actually done in order to prove how it was carried out; we may observe the result, and then by logical arguments be led to conclude how things were in past ages. Man did not happen to exist during the creation of the world; he can only get information on that point by reasoning. It does not do simply to wait and watch nature, as many of her actions are too slow for man to benefit by them during the limited span of his life, many ages being required to bring about results when left to themselves; besides, they are so frequently complicated that by leaving matters to observation alone, it is almost impossible to unravel the various phenomena concerned, so that we are forced to fall back upon experiments. Nothing must be considered too insignificant to be noted; the result of our conclusions may be stated in a few sentences and may appear very simple, and when the question is one of "Yes" or "No" you have equal chances in your favor, if you make a guess at the solution, which most persons are satisfied with doing; if however, you are a conscientious worker, the mass of evidence that accumulates is often enormous before you are satisfied that your contention is proved, and many of your observations have to be laid aside on further observation as foreign to the subject. We should first observe facts, without hampering them with theories; we are, however, so accustomed to rapid thinking that we are apt to jump to conclusions prematurely, and to note as observed facts whats are really our assumptions.

A man notes a rounded boulder on the top of a mountain; instead of stating facts as he really sees them, and describing its environments, if not a geologist, he will probably call it a waterworn block, and assume that it had been brought into that position by some great fluvial force. Or, again, he may observe a ferruginous concretion, loose in a rocky hollow, the entrance to which is too small to allow it to pass through, and wonder how a piece of shingle could get in through such a small space. Were he to note the surroundings, it is true he might find similar concretions loose in the soil in the beds of creeks or on the beach, which might appear as if their roundness were due to the action of water rolling them about; but closer observation would show these concretions in their matrix in various stages of formation. We not only want to know empirically that something happens, but we desire to ascertain why it happens; the origin of the results we see, and why out of all the possible combination of circumstances that suggest themselves to us, nature should have selected the one she has. In order to obtain this information we generally have to resort to experiments which increase our store of facts, and enable us to reason; in fact, we should always experimentalize when possible, so as to assist us in coming to a correct conclusion.

Things, the nature of which we desire to know can be regulated and combined in such a way that their actions under definite conditions can be observed. In this way, interfering with things, we got results more quickly than we otherwise would, and under conditions we might not be certain of in nature; besides, we might not be prepared to observe when the opportunity occurred. In experimenting for the discovery of laws governing nature, it is not always convenient to imitate her various irregularities, which would only cause confusion; we, therefore, adopt ideal cases for the sake of convenience, which generally takes some regular form with which we are acquainted, *e. g.*, experiments on capillary attraction are conveniently carried out in perfect cylinders, while investigations on falling bodies are generally conducted with spheres. Experiments are always liable to errors of manipulation, observation, and the choice of methods, which should be eliminated before deducing our points.

(*To be Continued.*)

Lumbering Scenes.

Our engravings offer glimpses of some features of lumbering operations in California. They show the sawmill set up in the midst of the giant trees, and the flume by which the sawed product is swiftly carried down from the almost inaccessible heights, where the lumber is sawn, to a shipping point upon the railway or beside navigable water. The scenes are characteristic of California, for probably nowhere else is lumbering carried on with so little expenditure for sawmill buildings and so much for water transportation of the product. The machinery of the mill is almost without sheltering roof, not to speak of sides. In this favoring climate, it is only necessary to secure firm foundations for the machines themselves, and strong constructions to transmit power from engine to saw pulleys. More than this, there is little thought of building. A sawmill is a scant affair anywhere, and hence the old saying "Cold as a sawmill," which many of us will remember from childhood, but in California the sawmill makes next to no pretension whatever of protection against weather of any kind.



SAWMILL IN THE PINE REGION OF THE SIERRA NEVADAS.

But what is saved on the mill and many times more is often expended on the flume. This, too, is a feature vastly more serviceable in California than elsewhere, because frost seldom touches the water in the flume, and it takes its swift flight in the middle of winter as well as in dogdays. It is seldom that even an icicle is formed by the water, which often drips from the timbers of the trestle. Another California advantage in the flume is that it carries both water and lumber to market, for after the water lands its load of lumber it often takes up a contract for motive power in a turbine, and is only finally at rest when it reaches the arid plain which it transforms into green fields, orchards and gardens by irrigation.

Our scenes are located in Butte county, where for many years there have been large lumbering enterprises, based upon the sugar pine of the Sierra Nevadas. All along the foothills on the eastern side of the Sacramento and San Joaquin valleys there are similar lumber-carrying enterprises, and the main lumber supply of the great valley is thus produced. Recently greater flumes than ever have been proposed; one of the largest is the enterprise which is to bring motive power to illuminate the city of Fresno, and to do other valuable work. Flumes are costly and they need constant repairing, but their work is done with such swiftness and certainty that the necessary investments are usually found profitable. Of course only a portion of the flume is carried on a trestle as depicted.

The flume shown in the engraving is sixty-two miles long and extends through two counties. It is only to cross depressions or to secure grade suitable to carry lumber far out upon the level plain that such timbering is required. Wherever possible the flume is built on the ground surface. Though usually the lumber and water get along well together and reach the end of the journey in good order, there are occasionally stoppages and a few carloads of timber may be shot down the side of an inaccessible gulch or strewn broadcast over a level field. It would sometimes cost more than this lumber is worth to regain it, so that driftwood lies along the length of the flume as thickly as along the beach of a well-wooded coast.



LUMBER FLUME FROM THE MOUNTAINS TO MOORE'S STATION, BUTTE COUNTY.

SCIENTISTS are coming to the conviction that the ruins found in Mashonaland, South Africa, are of Semitic and Arabian origin, and that the negroid race had nothing more to do with their construction than as the slaves of a race of higher cultivation.

Sale of Portion of Mining Claim.

If the locator of a mining claim should convey a portion of his claim, without any reservation in his deed of conveyance, his grantee would be entitled to all the gold that might be found within the ground conveyed, in any vein whose apex was within the surface lines of his deed. So if a locator should convey to A the east half of his claim, and afterwards should convey the west half to B, each of his grantees would, in the same manner, be entitled to all of the gold found in any vein which was entirely within lines of his conveyance, and, on the same principle, if the proprietor of a tract of mineral ground which has been derived through several locations should dispose of the same in parcels, irrespective of the lines of such locations, the right of his grantees would be measured by the terms of their deeds. In such cases Section 2336 of the Revised Statutes of the United States is subject to the characteristics of mining property given to it by prevailing customs, and not with the absolute dominion which flows from a conveyance in fee of ordinary land. The mining land thus granted is still subject to all mining laws and customs which are applicable, but the provision of Section 2336 that, when two veins intersect, "priority of title shall govern, and such prior location shall be entitled to all ore or mineral contained within the space of intersection," cannot possibly be applied to the case where A conveys part of his mining claim to B, for in such a case there is no "prior location." Therefore in such a case the ordinary rules which govern grants of land must, of necessity, apply, and if the intersection takes place on part of the claim conveyed the grantee takes all the mineral within the space of intersection. —*Stinchfield v. Gillis (Supreme Court of California) 40 Pac. Rep., 98.*

IN New York City there are about 500 venders of sawdust, having a capital of $200,000 invested, and doing a business of $2,000,000 annually. Forty years ago the mills were glad to have sawdust carted away; twenty-five years ago it could be bought for 50 cents a load; now it brings $3 50 a load at the mills. It is used at hotels, eating houses, groceries, and other business places. It is wet and spread over floors to make the sweeping cleaner work. Plumbers use it a great deal about pipes and buildings to deaden the walls and floors. Soda water men and packers of glass and small articles of every kind use it, and dolls are stuffed with it. Yellow pine makes the best sawdust, as it is the least dusty and has a pungent, healthy smell. But any light wood will do. Black walnut sawdust will not sell and is burned.

Mining Summary.

CALIFORNIA.

Calaveras.

THE PURE QUILL MINE.—Salt Lake *Tribune:* Sam Godhe returned to Salt Lake lately after an absence of three weeks, which was spent on the works of the Pure Quill mine in Calaveras county, Cal. He says that the Pure Quill don't helie its name, and is to-day one of the hest prospects on the mother lode. The shaft is now down seventy-five feet, and a stream hoist is heing erected which will soon he in operation. A test run was recently made on the ore and showed a value in gold of $13.75 per ton, from ores taken out from a complete crosscut of the vein.

Mr Godhe states that while there is considerable milling done around the vicinity in which the Pure Quill is located, there is but little practical mining conducted. The reason, as he puts it, is that mining as it is generally understood is unnecessary. The ore lies very close to the surface, and instead of mining it, it is quarried out and transported to the mills. The entire ore is free milling in character, and so large are the ore hodies that, says Mr. Godhe, some of the mines are actually mining and milling their ores at an average cost of 65 cents per ton. The average run of ore to the stamp is from three to five tons per day.

Mr. Godhe will remain here about ten days, and will then return to the Pure Quill.

THE BOVEE.—The Bovee mine, hetween Angels and Altaville, has been reopened under the superintendency of Edward McKay. This property has heen idle for over ten years. There is a shaft 230 feet deep.

EL ENCINO MINE.—At this mine work has been pushed night and day under the management of James Regan, driving a hedrock tunnel for drainage. The tunnel is through the rim of the channel and within 75 feet of shaft No. 1, which is on the southern end of the company's property. For over 1100 feet the tunnel was in very hard rock. Five air shafts were put down, to give ventilation and draw off the smoke. The head of the tunnel is in a soft formation requiring timhering. When shaft No. 1 is connected the company intends driving up channel a distance of 900 feet, to the present pump and working shafts. When this is done the mine will he operated on a large scale—hoisting the gravel at different points and crushing with stamps. F. Chappellett is the president and general manager of the company.

Inyo.

THE NEW RATES.—*Register:* The new rate of $13 per ton for working charges on lead ores hy Selhy & Co. at Vallejo Junctiou is generally accepted as very reasonahle hy mine owners and shippers in this and Darwin districts.

Nevada.

THE CROWN POINT SOLD.—A. Gauthier has heen paid several thousand dollars as a first installment on the purchase price of the Crown Point. It is expected that new machinery will he put in hy the new owners.

TO BE DEVELOPED.—*Union:* Peter Tautphaus, one of the prominent owners of the Providence mine, Nevada City, has arranged to purchase the Constitution and three other mines in a group, in the Willow Valley district. He will put up temporary works this fall, and next spring will proceed to erect an extensive plant preparatory to a thorough development and working of his properties.

Plumas.

GOLD BAR CONSOLIDATED CO.—Special correspondence.—The machinery for the Gold Bar Consolidated Mining Company has arrived at Gold Bar Camp, via Marysville, and will he made ready for operation at once. It consists of an improved tank pump, capacity 800 gallons per minute; a douhle-cylinder friction drum horizontal engine of 15 horse power, and a portahle steel hoiler of 30 horse power: As this will be next to the initial move in opening up a vast property a hrief description of the location may he in order. On the middle fork of the Feather river, 23 miles from La Porte and ahout 12 miles from Onion valley, hetween the mouths of Onion Valley and Washington creeks, there are a series of deep hars extending along this river for a distance of ahout eight miles. The surface on most of these hars has heen worked over by the early argonauts, but the methods then in vogue precluded the possihility of decp river mining, and so the rich hedrock was left undisturhed for the touch of modern mining machinery.

Some time ago A. U. Rugg, a mining engineer and a practical river miner of Plumas Co., secured the right to mine the property. The Gold Bar Consolidated Mining Company, with headquarters in San Francisco, was the first to commence operations on one of the hars, which has since hecome known as Gold Bar. It is situated just helow the famous Cleghorn har and on the opposite side of the river. A 20-horse power hoiler, with a horizontal engine coupled with friction gearing, and a centrifugal pump with a capacity of 40,000 gallons per hour, were set to work and a shaft put to hedrock, which was found at a depth of 29 feet. The result was sufficient to induce the company to order heavier machinery, which has just arrived. The bar is to be worked hy a series of open cuts, water for working and other purposes heing brought across the bar hy a 14-inch flume from the river ahove.

A similar method will he used in working the other hars, which are owned hy different companies, several of which are now engaged in preliminary work. A good road has just heen completed, leading out of the canyon to connect with the road to Onion valley, and it is now a pleasant drive of 2¼ hours from the latter point to the mine. The snowfall in this canyon is very light, and work ean be carried on the year round, an advantage enjoyed by no other section of Plumas Co. The force at Gold Bar is heing increased as fast as it is possihle to get good river miners—a rather scarce article, hy the way, in Plumas Co. just at present.

OPERATIONS AT SLATE CREEK.—Special correspondence.—W. J. Scrutton, superintendent of the Slate Creek Gravel Gold Mining Company, operating for the past three years on Slate creek, near La Porte, reports that the past season was an unprofitable one for his company, owing to the late snows and a freshet during the month of May that washed tailings over a large area of bedrock, uecessitating a second handling at great expense. Work commenced in Februarv, and the season was late. It required nearly two months, witb a large force of men, to place the hydraulic elevators. This work was accomplished hy shoveling snow which packed the creek to a depth of 40 feet. The run commenced in April, with a heavy hurden of expense already piled up on account of the "dead" work in handling snow, and continued for two months and a half, when the water gave out.

During this time ahout 14,000 cuhic yards of tailings were handled, of which some 6000 cuhie yards were washed down hy the May flood, making another item of "dead" work. The prospect for next season is hrighter, when an entirely new method will be adopted. The depth of the tailings, at the point now reached on Slate creek, precludes the possihility of using hydraulic elevators to advantage, and hereafter a tunnel will be used, for which the entire volume of water in the creek will he utilized. Operations next year will he commenced about the first of May. Two or three monitors are to he used for the purpose of sweeping the tailings into the middle of the creek.

AT LA PORTE.—J. H. Thomas has begun the opening of a hig mine near La Porte. Two large ditches that were used for some years will he reopened and put in condition for use next spring. One of these, known as Feather River Ditch, is seventeen miles long, while the other is hut little shorter. A strong dam will be constructed for restraining the debris and when all is completed he expects to hegin hydraulic mining on his mine.

Riverside.

THE GOOD HOPE.—*Record:* Ahout 45 men are now at work in the Good Hope, most of whom have leased ground and are working it for all there is in it. They work in pairs and the ore they take out is milled for $3 per ton, and they also pay a royalty to the company of 20 per cent. Some very rieh ore has heen struck in pockets, and some of the men have made as high as $6 and $7 per day in wages. This will not average all through, however.

San Diego.

ATTACHED.—The sheriff has levied an attachment on the Cargo Muchacho mine, owned hy the Paymaster Company, to secure the payment of a claim for $5000 alleged to he due Hass & Burt of Los Angeles for supplies. The property levied upon also included eight miles of pipe line connecting the mine with the Colorado river, and a carload of supplies at Ogilhy station.

THE GOLDEN CROSS.—*Sentinel:* The Golden Cross people started up 50 stamps of the 100-stamp mill. The machinery worked perfectly and everything gave complete satisfaction. As soon as the new pipe line is completed, which will he within a few weeks, the entire plant of 140 stamps will he droping upon ore from one of the higgest gold mines in the country. Taking the working of the old mill as a guide it is safe to say the output from the old and new mill combined will reach $125,000 monthly.

Shasta.

THE WASHINGTON MINE.—*Free Press:* The Washington mine at French Gulch shut down on the 12th inst. and all their men laid off. It is stated that another payment of $15,000 on the purchase price of the mine will soon he due.

PROPERTIES BONDED.—The *Democrat* hears that a wealthy syndicate have honded the old Greene mine at French Gulch and the Jay Eye See. It is expected that these two mines will he extensively worked.

A TALC MINE.—W. P. Bartlett has leased the talc mine on Flume creek for one year, will pay Mr. Conant a royalty of 50 cents per ton for the output and has begun operations. Talc is used for giving to paper the fine finished gloss, and must he free from all foreign matter which might tend to stain the pulp. The vein at Flume creek is fifty feet wide.

A NEW MINING CAMP.—*Free Press:* Conant & Fowler in Harrison Gulch have a ledge of free milling gold ore three feet in width the croppings of which can he followed for a distance of 2800 feet. The ore will mill $50 to the ton. Twelve tons, which were run through an arrastra, yielded $700. Conant & Fowler have purchased 21,000 feet of lumher with which to erect houses and a mill. They have purchased a Kendall patent quartz mill of a capacity of eight tons per day. They will have the mill in operation within thirty days, but will replace it with a stamp mill early in the spring.

There are five houses now in course of construction at Harrison Gulch. Two of these are large two-story buildings.

This new mining camp is situated on the headwaters of Cottonwood creek, in the extreme southwestern part of the couuty, about a mile and a half from the line hetween Shasta and Trinity counties, and two miles from the Hay Fork and Red Bluff road, with which a connecting road is now heing built.

The distance from this city to the mines is estimated at fifty-five miles.

Sierra.

PROPERTIES BONDED.—J. F. Parkinson of Palo Alto and F. Hall of this city have bouded the Wm. Tell and Butte Saddle Rock mines at Sierra City.

THE EL DORADO.—At the El Dorado, near Alleghany, a 10-stamp mill run hy water power is in constant operation. The ore shoot is three feet in width and averages $14 to the ton.

Trinity.

MINING PROPERTY CHANGES HANDS.—*Journal:* An agreement is made hetween F. Huertevant, who has recently purchased so many valuahle mining properties in the vicinity of Junction City, and W. Mahoney and J. C. Wallace for the purchase of the latter's placer mines, ditches, water rights, etc., ahove Canon creek. Under the terms of the agreement Mr. Huertevant takes possession at once, with full power over the property. The final payment will not he made until Octoher, 1898.

CRUSHING ORE.—*Journal:* The new five-stamp mill on the Vollmers & Doty mine, near Trinity Center, is at work. The ore is packed from the mine hy twenty mules, which carry five tons each trip, at a cost of $2 a ton.

Tuolumne.

GENERAL NOTES.—*Independent:* At the Shanghai the old works have heen tapped, and, at a depth of seventy-five feet from the collar of the shaft, water has been reached. Below the water level the timhers, ladders, skipways, etc., are as sound as when over twenty years ago the rich ore was hoisted to the surface. A steam pump will soon be placed in position. A string of mines adjoining will greatly appreciate in value should the prospecting in the Shanghai develop into what everyhody expects it to. Among these locations are: The Morgan, the Orion, the Wild Missourian, the Rihbon Rock, the Old Tuolumne and the Midas.

The Possihle mine is heing developed by A. S. Graham. A shaft ahout 100 feet deep has heen sunk, and the vein, though small, is rich.

The Star mine, after having lain idle for years, has heen developed into a very valuahle piece of property. Through the instrumentality of W. B. Moore, the Messrs. Williams of San Francisco have opened up the old works and prospected new ground, heing rewarded hy striking chutes of ore. Rock has been tested at the Sonora chlorination plant, and flattering results ohtained. A carload will he sent to the Selhy Company, San Franciseo. A 10-stamp mill is heing huilt at the Star under the supervision of Jas. Hamilton, and nearly fifty men are on the payroll.

THE WASHINGTON BONDED.—E. A. Stent has honded the Lady Washington mine, in Summerville distriet, and will hegin developing the property on an extensive seale at once.

NEVADA.

ESMERALDA COUNTY.

MORE NEGOTIATIONS.—James Yerington is again in Silver Star district with a party of capitalists, who will meet the mine owners at Sodaville and endeavor to hring about a sale.

LANDER COUNTY.

THE AUSTIN MINING CO.—President Stokes of the Austin Mining Company tells the *Reveille* that he desired that 1000 men he employed hy the company in the next fourteen months. He was asked if his purse would meet the demands of the employment of 1000 men, and his answer was, "Yes; put them to work and I will furnish the money." There are from $15,000 to $20,000 paid out hy the company now each month. Ahout 70 men are employed, and it is expected that the force will he increased to 100.

LINCOLN COUNTY.

DE LAMAR DISTRICT—(Special Correspondence).—Capt. J. R. De Lamar was here last week, when he made a thorough inspection of his property here. He went through the mine and was very well pleased with what he saw, and well he might, as in some of the drifts there is 50 feet of ore, which gives bullion returns of $25 to the ton. No. 10 tunnel, which is in 2000 feet, most of the way in ore, taps the ledge at a depth of ahout 600 feet, so that there are a great many thousand tons of ore in sight. The captain has spared no expense in opening up his mine. Everything is done in a thorough, miner-like manner. Of course, he will reap the reward from this in the future. The mine at present, although a great deal of development work is heing done all the time, pays a handsome dividend. The eaptain has heen experimenting for the past six months on a new process, and will now adopt it, as it suits the De Lamar ores the hest. The mill has heen increased to douhle its capacity, and after this week will treat 200 tons of ore per day.

Frank Wilson has purchased another one-third interest in the April Fool group of mines. This gives him two-thirds interest in this valuable property, which is said to he as good as the De Lamar Company's mine. A mill will he erected at once by this company.

Several claims are heing surveyed for patent which take in the greater portion of the town. The owners of lots will contest these patents, as it is claimed that a patent is not sought for this ground on account of the mineral it contains, hut for speculative purposes.

Outside capital has commenced to place an eye upon this camp, and hefore next spring we expect to see another good company in here, doing active work. Building is going on as fast as the sawmill can furnish the lumher. Two-story hricks are also heing huilt.

OREGON.

GENERAL NOTES.—C. P. Church of Portland has taken an option on 1100 acres of placer land in the western part of Josephine county. The price agreed on is $45,000, of which $5,000 has already heen paid.

The Tolo Mining Co. will resume work on their quartz ledge, and operate it on a larger scale than ever.

Lewis Catching has leased the Myrtle creek mines for the ensuing year, says the Rosehurg *Review*, and will run three pipes during the coming winter.

Superintendent McNally of the Virtue mine brought into Baker City Saturday gold bullion amounting to $12,000, the output of the mine for 22 days on low-grade ore.

WALNO COPPER MINES.—All the machinery for the copper mines near Waldo has arrived, and the smelter at the Siskiyou mine will he in operation next week.

LINN COUNTY.

THE SANTIAM MINES.—In the White Bull mine, worked by an English syndicate, wire gold has been found. The English company, under the management of Mr. Lawler, is running three tunnels to connect the White Bull and Red Bull mines. Shafts have also been suuk, and they have 500 to 700 tons of ore on the dump and nearly 100 men at work.

WASHINGTON.

THE IRON KING.—The owners of the Iron King mine on Palmer mountain, Okauogan county, have put men at work to siuk 100 feet and test the value of the claim. The surfaee ore assayed $2.50 in gold, 5 per cont copper and 5 per cent uickel.

IN SULTAN BASIN.—Colonel A. N. Hamilton of Seattle says the Sultan Basin and Stillaguamish Mining Company, owning the Little Chief, reports that there are now $1,000,000 of ore in sight. A small force of men will be kept husy the coming winter and in the spring fifty miners will he employed. A spur will ho huilt from the Great Northern to the mines, 23 miles up the Sultan river from Sultan City.

BRITISH COLUMBIA.

GENERAL NOTES.—The wire tramway from the Hall mines to Nelson will he completed within two weeks.

The *Tribune* gives the total west Kootenay ore shipment for the year at 20,299 tons, valued at $1,706,500.

The Kootenay, Copper Jack and Tip Top mineral claims at Trail are sold for $40,000 cash.

The Alamo, in the Slocan, has paid its first dividend of $35,000.

A concentrator of 50 tons daily capacity is huilding at the Washington, Slocan. It will he finished in 90 days.

The government will dredge the Lardeau and Duncan rivers for 40 miles above Kootenay lake, thus extending navigation 60 miles.

Thirty-eight claims have heen staked this summer on Cariboo creek, which runs into the Columhia 20 miles south of Nakusp, and several on Mineral creek, a tributary. Placer mining has heen practically ahandoned. The Golden Eagle has a strong ledge, the iron capping of which shows $10 to $15 to the ton. On the Promistoria, on Mineral creek, streaks running $167 in gold have heen found, hut they are not permanent. The owners, Demers, Bourne & Road, have refused a working hond of $15,000 on the property. The War Eagle runs at $6.25 in gold and $80 in silver. Snow has fallen and work is practically stopped until next spring.

A MICA MINE. — Kamloops *Sentinel:* The pack train that returned on Friday last from the Tete Jeune cache, hringing 1,500 pounds of mica, will show whether or not with present means of travel and transportation that property can he worked successfully and profitably. This mica is said to be of exceptional good quality, in pieces large enough to furnish clear sheets squared to 12x18 inches.

NINE MILES LONG.—The cable for the Hall mines tramway, near Nelson, was spliced last week, and is now an endless chain of nine miles, supported on 123 towers, its upper end heing 4,500 feet ahove its lower. There will he 900 huckets.

The Nelson *Tribune* reads a lecture to a Slocan claim owner who has 100 tons of ore on the dump, yet is waiting for the government to huild a trail for them at a cost of $1,500. Men with no push, the *Tribune* says, are of no use in this world and should be preparing for the next.

Some of the greatest financiers in Europe are shareholders in the Lilooet-Fraser River Cariboo Gold Fields Company. Among them are Henri Rosenheim, the principal controller of Society Generale, Jules Baron de Machiels, senior partner of Jules de Machiels & Cie, Gustace Baron de Rothchilds and Baron de Hirsh.

A TRAIL CREEK SALE.—The Cliff mine and Consolidated have heen sold hy Spokane owners to F. T. Barnard of Vancouver. The reported price paid for the Consolidated is $75,000 and for the Cliff $150,000.

ALASKA.

ELECTRICAL PLANT FOR BERNER'S BAY.—The Great Northern Express Company yesterday reeeived one of the largest express packages that ever came to the city, says the Seattle *News*. The hox weighed 3050 pounds and was consigned to the Berner's Bay Milling and Mining Company, Juneau, Alaska. It consisted of an electric light plant from a firm at Scheuectady, N. Y., and will he used in the company's mine at Berner's hay. The shipment arrived in time to he put aboard the steamsbip Alki and will therefore reach Juneau in eight or nine days from the day it left Schenectady.

UTAH.

A SALE OF TAILINGS.—Park *Record:* The hig tailings dump below the Anchor concentrator, containing some 15,000 tons, and carrying silver, lead and zinc, has heen sold to Eastern parties, and arrangements are heing made to work it. The sale was made on a cash hasis, and includes all the tailings the mill may produce. Zinc is the predominant metal in the tailings, and will require a special plant for its extraction, and as it will he considerahle cheaper to huild here than to ship the product, a plant will probahly he constructed.

IDAHO.

CAMAS NO 2.—Superintendent Wood of the Camas No. 2 mine, near Hailey, Idaho, says the 20 stamps are working regularly. He contemplates putting in 20 additional stamps in his mill. These, he thinks, can he run with the water supply now available. More stamps could not. The drift on the 400-foot level has

penetrated the ore body 40 feet. The ore averages $35 per ton. There are over 800 cords of wood on hand at the mill and contracts are let for 700 cords additional. This is about a year's supply, the mill burning 90 and the mine 30 cords a month.

MONTANA.

TO CONSOLIDATE.—The Cœur d'Alene Silver-Lead Mining Company has voted to consolidate the Tiger and Poorman properties and to capitalize the concern at 1,000,000 shares of the par value of $1 each, 500,000 to each mine, and each stockholder in the Poorman to receive the same number of shares as now held.

THE SNOW SHOE MINE.—The Chicago and Montana Mining Company, who are operating the Snow Shoe mine, have 265,000 feet of lumber on the ground for the concentrator, and 200,000 feet more is contracted for. The ore in the mine is improving in quality, the assays now running $60 to the ton.

IN BASIN CREEK.—The Merrill G. M. Co. has organized with $100,000 capital to work the Neptune and Venus mines, at the head of Basin creek. A 10-stamp mill will be immediately built.

WYOMING.

OPENED THE FOUR-MILE CANAL.—The revival in the gold-mining industry near Cheyenne was marked last Saturday by the opening of a large four-mile canal, which has been constructed by Eastern capitalists for the purpose of furnishing water for washing 1500 acres of gold placers, yielding from 20 to 80 cents per cubic yard, and from 12 to 30 feet deep.

ARKANSAS.

ARKANSAS ZINC MINES.—Gov. Fishback says there are 216 square miles of zinc in the Arkansas field. Occasionally a man will claim that the region has been well prospected. He means that the prospectors have walked over the mountain slopes and up and down the creeks, locating claims where they found ore sticking out of the ground and where the crack of the hammer on an outcrop exposed the mineral. Of prospecting in the sense that the word is used by the miners of other fields, that region knows nothing. Mineral Surveyor Hamilton has made an examination of some of the principal prospects. He found 75,000 tons of zinc ore on the dumps and 220,000 tons in sight. The labor expended in producing this result represented but a small fraction of the value of the ore.

COLORADO.

A NEW INCORPORATION.—D. Sullivan, S. T. Burke and H. C. Bolsinger have incorporated the Vendome Mining Company and bought all the properties of the Herbert Mining Company and some adjacent mines, comprising about 40 acres in Gilpin county. The price paid is $400,000.

NEW COMPANIES ORGANIZED.—Two new companies have been organized in London to operate in Cripple Creek district—the Cripple Creek Exportation Syndicate, limited, capitalized at £30,000, with shares at £1 each, and the Cripple Creek Gold Mines, limited, with £100,000 and shares at £1 each.

CRIPPLE CREEK DISTRICT.

Mail: Paris, France, capitalists have bought the Mattie D. and Ingham lodes, $125,000 cash being paid for them. Six months ago the Mattie D. was bonded for $40,000, payable in four months, and at the same time the same parties bonded the Ingham for $30,000. Time expired on the former sixty days ago, but a cash payment of $4000 got an extension of two months. The limit was reached, but another extension was gained by raising the bond $50,000. The properties have been worked right along and are located on the northwest slope of Raven hill, adjoining the Doctor.

ARIZONA.

HARLAN'S MILLS.—W. H. Harlan is operating two small mills and building a third one on Groom creek, near Prescott, to be run on custom ore. Next summer he intends to put up a small reduction plant in connection with his mills, and instead of being compelled to ship concentrates will smelt them there.

Personal.

SAM'L THOMAS, president of the Ohio Southern Railway Co., is only 22 years old.

PROF. BLAKE of New York is the new incumbent of the chair of geology in the university of Arizona.

A. S. HALLIDIE left Nelson, B. C., last Tuesday for Boston. He expects to return to San Francisco about Nov. 10th.

F. I. HELLMAN, who recently left Virginia City, Nev., for South Africa, is superintendent of a mine 40 miles from Johannesburg.

R. R. WHEELER, late superintendent of the Golden Cross at Hedges, has present charge of operations at the Santa Rosa, Riverside county.

J. H. TIBBITTS, who has been doing field work for the State Mining Bureau, goes to South Africa to superintend a mine at an annual salary of $8000.

TAYLOR D. MACLEOD has resigned the superintendency of the Green Mountain mine, Plumas Co., and will give attention to his San Diego Co. properties.

R. H. CAMPBELL is examining the Horsefly property, Carihoo, B. C., where he proposes to put in a hydraulic elevator, similar to the one in operation at Quartz Valley, Siskiyou Co.

C. R. JOHNSON of the Union Iron Works sailed for Buluwayo, Matabeleland, South Africa, this week, where he will superintend the erection of some California gold mining machinery for C. Jefferson Clark.

HUGH MCDONNELL, credited with having engineered the sale of the Iron Mountain property to its English purchasers, is in Redding, and the *Democrat* declares another big sale of mining property will shortly be reported.

Coast Industrial Notes.

—Demarest & Co., of Altavillo, are about to build a foundry at Jamestown, Cal.

—The British Columbia seal catch of '95 aggregates 72,414, worth on an average of $10.50 each.

—The *Californian* says that at a recent horse sale in Bakersfield a pair of big horses sold for $2.

—The rate on flour from Sacramento to Colfax, a distance of only fifty-four miles, is $4.80 per ton.

—Portland, Or., figures up a population of 81,342—making it the second city on the coast in point of size.

—A new camp has been started and fifty more men put to work on the Portland and Astoria railroad.

—The People's Telephone Co. has incorporated at San Jose; Capital stock $50,000; object to build a telephone system in that city to connect with the system of the California Telephone Construction Co.

—The San Francisco demand for Los Angeles oil increases. In September the S. P. Co. brought here twenty-five carloads. So far this month, nearly twice that amount has been received. Arrangements are now in progress to insure successful water transportation.

—Two rival enterprises propose to connect Oakland with the San Francisco and San Joaquin Valley Road. E. P. Vandercook has a franchise for a line, to be operated by electricity, to run via Livermore and Corral Hollow to Stockton, which will shorten the distance between San Francisco and Stockton fifteen miles, standard gauge and equipped for passengers.

—The largest cannon in America is at the Union Iron Works at the Potrero, awaiting its installation in one of the main turrets of the battleship Oregon. The Oregon is awaiting its turret armor and its builders are awaiting about $500,000 of their money, still in the Government vaults, to be paid when the Government finally accepts the vessel, which acceptance is indefinitely delayed by the Government's failure to furnish material.

—The Northern Pacific will soon begin laying the 1400 miles of new steel track which the report of ex-Receivers Oakes, Rouse and Payne, recently filed with Judge Jenkins, states will be necessary during the next five years to keep the road in good condition. The cost, according to their report, after deducting the value of rails taken up, will be $2,500,000. The purchasing department has awarded contracts supplying 500,000 ties during the next year to W. C. Davies of Tacoma and S. T. F. Greenough of Missoula, Mont. The ties are to be laid when the first of the new rails are put down.

A Question Answered.

TO THE EDITOR:—Please answer through your columns the following query and oblige many readers, viz.: If John Doe has not done his assessment work for the year of '94, and has not relocated his claim by having it recorded again in the mining district and county, and Richard Roe comes along in '95 and "jumps" his claim, *i. e.*, puts up a notice of location, has it recorded in the mining district, and with the county recorder, is not his claim valid, and has not John Doe lost his right therein? SUBSCRIBER.

San Francisco, Oct. 23, '95.

The neglect or refusal of John Doe to do any work on his claim in '94 does not in any way affect any of his rights in and to that claim. A congressional act suspended the assessment requirements of the Federal Statutes regarding required annual work on claims in and for '93, and again in and for '94. John Doe was not required to do any assessment work on his claim in '93, nor in '94, and has sixty-six days left to do his annual assessment work for '95, if he has not already put $100 worth of work or improvements thereon since the 1st of last January. Failure so to do would render his claim liable to relocation on January 1st, '96, but not till then.

Commercial Paragraphs.

In last week's issue, in an item regarding a contract of the Niagara Falls Hydraulic Power and Manufacturing Co. with Jas. Leffel & Co., of Springfield, O., for four of their improved double discharge, horizontal shaft turbine wheels, they were stated to be 7500 H. P. capacity. Subsequent data received concerning the matter is to the effect that the wheels are to be of 8000 H. P. under a maximum head pressure of 218 feet.

Under date of Aug. 2, '95, Secretary W. H. Payson of the Bald Eagle Mining Co. writes as follows to the Western Manufacturing Co., 114 and 116 Mission street, this city: "We take pleasure in informing you that the two 2-stamp Briggs quartz mills which we purchased from you for our Bald Eagle mine at Sumdum, Alaska, have so far been very satisfactory. The mills were erected on the 1st of June last, and our average for the month of June was 18 tons per 24 hours, and we are now averaging 20 tons per 24 hours, or 5 tons to the stamp. This is fully equal to what you represented the mills would do, and is a remarkable showing, considering the fact that it was the first month's run and there is always a little delay in getting the machinery into running order. We shall take pleasure in recommending your mills to those who enquire of us."

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCTOBER 15, 1895.

548,025.—STREET CAR BRAKE—H. T. Atkinson, Oakland, Cal.
548,110.—SASH FASTENER—L. L. Bettys, Berkeley, Cal.
548,029.—SACK FILLING MACHINE—Bibb & Timewell, Spokane, Wash.
548,033.—SAW SET—J. A. Campbell, Asotin, Wash.
548,050.—FURNACE DOOR—E. W. Harris, Palisade, Nev.
547,789.—FELLY EXPANDER—C. Hoffman, Spokane, Wash.
548,058.—RECOVERING CYANIDES.—B. Hunt, Wickenburg, Ariz.
548,074.—TROLLEY ROPE—C. A. Lord, S. F.
548,078.—CURRENT PUMP—L. E. Miller, Los Angeles, Cal.
548,091.—SAWMILL—T. T. Rainford, Tacoma, Wash.
548,016.—PULVERIZING MILL—F. N. Speer, Los Angeles, Cal.
547,971.—SAW SHARPENER—P. F. Toppendorff, Scotia, Cal.
547,823.—RAILWAY—D. S. Van Slyke, Los Angeles, Cal.
548,102.—SAFETY GUARD FOR CARS—W. Watkins, S. F.
548,150.—ORE EXTRACTOR—Williams & Phillips, Seattle, Wash.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SIDEHILL PLOW.—Albert D. Williams, Lafayette, Cal. No. 547,192. Dated Oct. 1, 1895. This plow consists of a frame having pivoted to its beam a tilting or rocking lever, from the extremities of which are supported plow bottoms, one at each end, said plow bottoms being reversed with respect to each other and adapted, by means of the rocking or tilting of the lever, to be alternately raised and depressed, so that while one is working in one direction the other is raised up out of the way, and when the other is working in the other direction the first is raised up out of the way. In order to change the team from end to end, there is a guide rail on one side, secured at each end to the frame, and a draft link sliding on the rail. The beam wheel has means for raising and lowering it, and it will remain equidistant between the plow bottoms. The small wheel opposite the main wheel has means for adjusting it, so as to tend to throw the plow to the land. The object of the invention is to provide a simple and effective plow for sidehills adapted to be readily reversed without having to turn the entire frame or to loosen fastenings, for the purpose of turning the plow bottom on its own axis.

MACHINE FOR WASHING, PRICKING AND SPREADING FRUIT.—William C. Anderson, San Jose, Cal. No. 547,194. Dated Oct. 1, 1895. This machine, as its name implies, has for its combined object the preliminary washing, the subsequent pricking and the final spreading of fruit onto trays, particular reference being made to the preparation of prunes for the drying process. The machine consists essentially in the combination of means for first washing the fruit, with means for puncturing the skin after the fruit is washed. Added to these features are means for spreading the washed and punctured fruit on trays. In the operation of the machine the prunes pass over a grating through which the debris falls. They then fall upon the vibrating fingers which direct them to a traveling carrier. The fingers and the lower end of the carrier operate in a water bath, so that the prunes are washed. Being raised up out of the bath by the carrier, they are next delivered to a shaking table provided with pricking points, whereby in their passage over the table they are punctured. From the table they are delivered into a distributing hopper and thence to the trays.

BARBED WIRE STRETCHER.—Hiram L. Farrier, Oakland, Cal., assignor of one-fourth to Charles W. Kellogg, San Francisco, Cal. No. 547,340. Dated Oct. 1, 1895. The object of this invention is to provide a convenient implement for use in putting up barbed wire fences, and by which the posts may be set, the wire conveyed from post to post and stretched and fastened thereon without the aid of supplemental posts or attachments. It consists of a barb having a tamper fixed at one end, a crowbar at the other, and a mechanism to clamp the wire, with a guide to prevent the wire from slipping from the clamp, and fulcrum bars upon the side of the lever, near the clamp, by which it can be used to grip and stretch the wire between the posts while being fastened.



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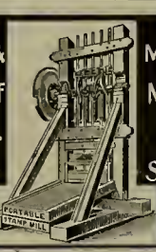
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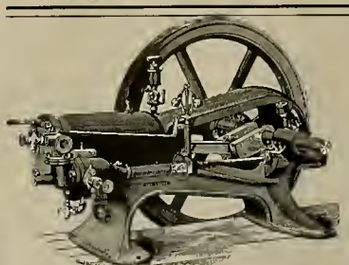


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For a number of years THE SETH THOMAS CLOCK CO., of Thomaston Conn., has done a good deal of work for Electrical Companies, and would be glad to increase this line of business They will make estimates for any article akin to clock work for which a model is furnished and which is wanted in quantities. Address SETH THOMAS CLOCK CO., 49 Maiden Lane, New York.



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Scientific Progress.

Testing Pacific Coast Timber.

Many requests for information relative to the resistance to the several stresses occurring in construction, which is offered by our California redwood (*Sequoia Sempervirens*), have been received at the new civil eugineering laboratory of the department of civil engineering, University of California, since it has become known that they are engaged in testing various building materials, and in consequence, the following abstract of results, as obtained from the first set of tests upon redwood, is issued for the benefit of the engineers, architects, contractors, builders and others, on this coast and elsewhere, who may have occasion to use, in some new or peculiar way, this well-known material.

The tests were made in the civil engineering laboratory, by means of the new Olsen Universal automatic and autographic testing machine, of 200,000 pounds capacity.

The series of tests will be continued at length, in order to fully develop the characteristics of redwood, as well as those of other Pacific coast timbers.

The following are tests of Humboldt redwood, presented to the laboratory by Mr. C. D. Henny, of the Excelsior Redwood Company, Fourth and Channel streets, San Francisco, Cal. The pieces were clear, straight-grained, well air-seasoned and dry:

Average specific gravity of 126 pieces	0.48
Average weight per cubic foot—Pounds	29.91
Percentage of moisture, average	15.

ULTIMATE STRENGTH.

	Lbs. per Square Inch.
Tension, mean of 27 specimens	6,521
Compression, longitudinal, mean of 31 specimens	4,385
Compression across the fiber, reduction in height of piece of 3 per cent, 30 specimens	966
Reduction in height of 15 per cent, 30 specimens	1,197
Longitudinal shear (pieces clamped to prevent splitting, mean of 8 specimens	548

Following shows the result of experiments with beams of redwood supported at the two ends, loaded at the middle, broke by compression:

	Lbs.
Modulus of rupture, average of 9 specimens	4,955
Coefficient (modulus) of elasticity, mean of 8 specimens	797,467

The department of civil engineering of the University of Cal. has moved into more commodious quarters, and has equipped a laboratory with apparatus designed to test specimens of the various materials used in engineering construction. The list of apparatus includes a Universal testing machine of 200,000 pounds capacity (one of the largest in the United States, and the most powerful on the Pacific coast); a lathe for turning specimens of timber or metal; saws; a cement testing machine of 2000 pounds capacity; and many small tools used in preparing specimens, measuring, etc. It is proposed to add to these other machines with which to test road metal, building stone and other substances.

A long and thorough series of experiments upon the various timbers of the Pacific coast will be made, with the purpose in view of bringing forward prominently their good characteristics, and of obtaining complete and reliable scientific data concerning the best use of them in engineering.

All tests desired, which are in the nature of purely scientific experiment, will be made, free of charge, for engineers, architects and other persons engaged in construction, upon the delivery of the specimens required, at the civil engineering laboratory of the University, and an official report of the results of the tests will be promptly forwarded to the owners of the materials.

Tests of materials to be disposed of commercially will be made for companies or persons requesting them upon the payment of a small fee necessary to defray the expenses of the tests. The same rates will be charged as in the East.

All persons contributing timber, stone or the metals, according to the directions accompanying this bulletin, will, if desired, be put upon the mailing list of the laboratory, and will thereby receive the official reports of all experiments made by this department.

Residents of the Pacific coast, and particularly of the State of California, are cordially invited to co-operate in making these tests as extensive and thorough as possible. W. G. Curtis, assistant general manager of the S. P. R. R. has agreed to transport samples for tests to Berkeley.

Materials so contributed should be addressed: University of California, Department of Civil Engineering, Berkeley, Cal.

Different Forms of Commercial "Gas."

The gases commonly used to produce light, heat and power differ from each other both in the modes of producing them and in the proportions of their constituents. The old fashioned illuminating or coal gas is made by putting bituminous coal in a retort and heating the latter. The newer illuminating gas, commonly called water gas, is manufactured by passing steam through a mass of incandescent coke. This product is not only deficient in heating qualities, but is also unsuited to lighting until it has been enriched by the addition of selected gaseous compounds of carbon and hydrogen, of which acetyleue is the most valuable. For fuel, either in great industries or domestic service, by far the best gas is that which nature has distilled down in the earth's crust, and for explosion iu the cylinger of a gas engine the most economical article obtainable is made in very uearly the same way as water gas; but the process is continuous, instead of intermittent, and the stuff known as producer, or Siemens gas. Natural gas and the artificial product obtained with a retort for illuminating purposes abound in methane (or marsh gas) and free hydrogen. Water gas and producer gas, on the other hand, are deficient in these elements, but contain great quantities of carbon monoxide and nitrogen. Carbon monoxide is to some extent combustible, but not so valuable in this respect as methane and hydrogen; and nitrogen has no value whatever, merely diluting the compound and affording just so much extra matter to be heated and moved by its associates.

Mechanical Progress.

The Chavanne Regulator.

A. Chavanne, of Grass Valley, Cal., has recently patented an invention to provide the nozzles of water pipes discharging a stream of water under high pressure with a regulator.

Figure 1 is a sectional view of the nozzle and its water connections, showing the regulator, the manner of operation and also a section of a power wheel against which the stream of water is to be directed.

Figure 2 is a vertical section through the chamber or casing of the water connection at right angles to the section of the figure 1. *A* is a nozzle having the usual conical tip *a*. *B* is a casing or chamber in communication with the nozzle, *C* is the water connection from the source of water under head of pressure. Within the nozzle is fixed by an upright bracket *d*, a guide sleeve *D*, in which slides the plug *D*, which moves in the line of the axis of the nozzle. The forward end or head of the plug is made conical, or tapering, at *d*, and corresponds to the incliuation, or taper, of the interior of tip *a*, so that when pressed forward it will completely close said tip. Beyond this conical portion d^1, the head of the plug or valve extends, the extension is best made in a series of reduced diameters joining on another by inclined shoulders, represented by d^1, d^2, d^3, and varying in number as may be desired. Here are shown, for example, three. The plug *D*, which forms the regulator, is moved back and forth by the following means: Within the casing or chamber *B* is a shaft *E*, suitably mounted therein, and having one end exteuding outwardly through its side in a suitable stuffing box *e*, whereby through a crank e^1, connected to its end, the operating rod or connection *F* may be attached. Withiu the casing or chamber *B*, the shaft *E* has mounted upou it another crank arm, e^2, exteuding downwardly, within the casing, and having, attached to its lower end the connecting rod e^3 which joins it with the rear end of the slidable plug *D*.

By forcing the plug forward, so that its conical portiou d^1, fills the conical tip of the nozzle, the nozzle is closed, and the discharge of water cut off. By moving the plug back to its innermost limit, in which the smallest of its reduced diameters lies within the extremity of the tip (figure 3 dotted lines) the tip is open to its fullest extent and the largest amount of water will pass through the nozzle. By moving the plug to points intermediate of these limits, the amount of water discharged is varied correspondingly as shown in figure 3.

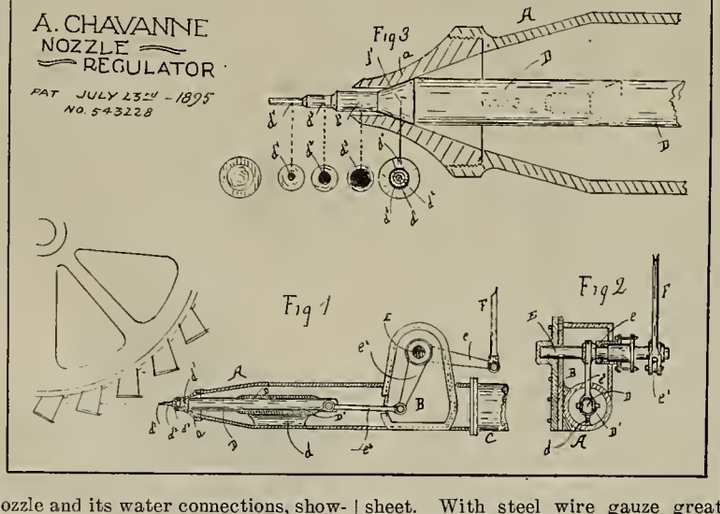
The inventor claims that with this regulator the stream at the outlet of the tip *a* emerges in a sinuous annular water tube, concentric with the head of the plug, without losing any of its impulsive power.

This new regulator is in present operation at the Independence mine, Grass Valley, Cal.

New Use for Steel Wire.

The incorporation of steel wire gauze with sheets of papier mache, or unprepared wood pulp, has made it possible to utilize paper advantageously as building material. Using the wire mesh as a body, the wood pulp is compressed on both sides of the same, to any desired thickness as well as size of sheet. With steel wire gauze great strength of the sheet is obtained from very little substance, and the buckling tendency of the paper fully counteracted by the rigidity of the wire. Experiments proved that a thickness of ⅛ of an inch of the material was sufficient for all roofing, an unsupported sheet of that thickness sustaining the weight of several men. Among other qualities is a system of thorough waterproofing and a method of fastening with steel bands, the simplicity of which is such as to enable any pressure upon the sheet to be borne by the whole of the fastening nails at once.

The material is said to be an effective non-conductor, and successfully resists heat, cold and wet. It also lends itself well to artistic treatment, both in variety of tint and association with timber work, this being attributed to the terra cotta like effects produced by the mixing of fine sand of various colors with the paint. — Northeast Lumberman.



Horseless Vehicles.

Carriages without horses have long been popular in France, where the best of roads have been built. Since 1892 they have been coming rapidly into favor through the invention of a petroleum motor. The recent race from Paris to Bordeaux was made with carriages of two or four seats. The motor is situated either at the back or front of the carriage. A lever is held by the driver for setting the carriage in motion and for steering. From two to five minutes suffice for starting time. The petroleum carriage moves backward or forward and at an average speed of eleven miles an hour. The petroleum is used as a fuel to produce steam. A novice may ride over 200 miles in two days of ten hours each.

Electrical carriages have thus far proved too cumbersome and expensive, the batteries alone costing $500; but they are clean, noiseless and require no skilled operator. Petroleum vehicles are light, more convenient in running and require no engineer. One of the best electrical wagons so far made in this country is by a Boston inventor, but weighs 5100 pounds. An electrical wagon in Philadelphia has run several hundred miles, but is clumsy with its 4250 pounds, of which the batteries weigh 1600 pounds, but give a maximum capacity of thirteen horse power. From 50 to 100 miles is made on one charge with a speed of fifteen miles an hour. Two residents of Kansas City have introduced an electrical wagon in Brooklyn, N. Y., weighing 3000 pounds, having 1800 pounds of storage batteries. At Lock Haven, Pa., a hotel runs an electrical bus with seats lengthwise and batteries under them. The batteries run the bus fifteen days of ten hours each. It carries 3000 pounds and weighs 1600 pounds.

U. S. Cousul Chancellor at Havre, France, has recently reported to the Department of State as follows: "French bicycles and tricycles are propelled by a small petroleum motor. The weight of the entire machine is considerably under 100 pounds and costs $250. The rider, after starting his motor, propels the machine with his feet unail the motor is working, after which he drops the treadles. On mounting a hill the rider can assist the speed by gearing the pedals again. Before this system can be profitably applied in the United States it will be necessary to bring our roads to the condition of European highways. In France all carriages pay an annual tax of from $9.50 to $13.50, according to their seating capacity. Bicycles pay $1.93, and no vehicle is allowed on the road until the tax is paid."

At Springfield, Mass., a company has been formed to manufacture a horseless gasoline carriage for light riding purposes, and it is expected the first three of its carriages will be eutered in the November horseless carriage race at Chicago.

A. Schilling & Co. of this city make a gas engine tricycle which has attracted considerable attention. The engine is 2 H. P.; the tricycle will carry three persons over grades and roadways of varying conditions and attains a speed of teu miles per hour on frvorable ground.

Electrical Progress.

Electricity for Logging.

N. E. Britt of the Oregon & California Railroad land department, Portland, Or., says: The unaccessibleness of the timber in the Pacific Northwest is much more imaginary than real. It is a sort of bugbear that frightens a great number of lumbermen who would become investors. Now, I do not hesitate to say that the great bulk of the timber in the Northwest can be got out cheaper than logging is carried on in the Wisconsin and Michigan forests. And the conformation of the country is what will produce this very result. Study for a moment. Here we are running many scores of street cars by power conveyed for miles through a single wire from Oregon City. There is not a township of timber land in Oregon that cannot furnish enough water power from one to a dozen or more streams flowing through it to handle nearly every stick of timber on it. I have been all through the timber regions, and have a pretty definite idea of the subject. Railroads can be built everywhere along the grades afforded by the larger streams, and by these means the electric power conveyed, as I have suggested, by wire from a dynamo and wheel at the nearest practicable water course. There is no place where this would be more than four or five miles distant. It would be an extremely simple matter. Your poles are already standing. Connect your power with windlass and cable and then you are ready to yank the logs out of the hardest places, with little or no outlay for skid roads, no injury to cattle and a good deal of money saved by the rapid handliug. They are using donkey engines, with a windlass and a cable 300 feet or more in length in many places now, and the logs are being handled cheaply and expeditiously.

There are patches of timber like the big Mohawk tract of 65,000 acres in Linn county, where there are billions of feet of the finest timber in the world, with scores of streams draining it, and affording a dozen times as much power as will be required to get every log out of it. Of course, it is admitted by every Eastern lumberman that our timber has no equal, and when they come to give the subject something more than superficial attention they will acknowledge that logging will continue to be cheaper here than iu Wisconsin or Michigan.

Very Probable.

The current number of the *Engineering Magazine* has an article by P. B. Delany on the future of the electric telegraph and the possibilities of mechanical transmissiou, in which it is asserted that the final destiny of the telegraph is to carry all correspondence of any urgency. The system will be onc haviug no electro-magnets, no armatures or movable parts, but will be based upon electrolysis. It will be the chemical plan of recording messages. Recent improvements have been made in the perforating machine, transmitter and receiving instrument for automatic chemical telegraphy. The letter of the future will be dictated to a stenographer, who, instead of typewritiug it, will perforate it on a paper tape. This tape will be sent to the telegraph office, where it will be put through the automatic transmitting machine, and in a second or two it will be at its destinatiou. The receiving tape will be delivered direct, and the plain Morse characters will be translated on the typewriting machiue hy the correspondent's stenographer. Between New York and Philadelphia, over a copper wire weighing 300 pounds to the mile, 3000 words per minute can be recorded perfectly, and, with a copper wire weighing 850 pounds to the mile, 1000 words per miuute cau be carried from New York to Chicago. Reduced to dollars and cents, it is estimated that fifty words, about the average of a business letter, can be transmitted 1000 miles in three seconds for 15 cents. This is a matter of special interest to the Pacific coast, where magnificent distances prevail. When telegraph tolls cease to be a burden, business will be enlarged—more can be done during the day—when the time of communicating with commercial centers in other parts of the country will be reduced from days to seconds.

Electric locomotive No. 1, used in hauling freight trains through the Belt Line tunnel of the Baltimore and Ohio Railroad, has again demonstrated that its drawing power far exceeds the expectations of its builders. Forty-four loaded freight cars and the three steam locomotives, not working, which had been used to haul the heavy train on the surface, were coupled to the electric giant at the tuunel entrance one day last week and pulled up the heavy grade of the tunnel, a speed of twelve miles an hour being developed. The total weight of the train was 1900 tons. The draw-bar pull exerted in starting this unusually heavy load was more than 60,000 pouuds, and continued through the trip at more than 40,000 pounds. The officials claim that no steam locomotive has ever approached this record.

There are two methods of electrically lighting railway trains by means of storage batteries. One is to have duplicate batteries so that one may be charged while the second is in service. The other is that system in which a small dynamo is belted or geared to one of the axles. When the car moves, the motion of the axle is communicated to the armature of the dyuamo, and the current that is thus generated is used to charge the battery. In this case the battery acts as a reservoir, giviug steadiness to the light and making the illumination continuous and uniform in spite of the variations in speed and stoppages of the train. Under this system it is possible to get along with a single set of batteries for each car.

Practical Information.

Active Aleutian Volcanoes.

The reveuue cutter Commodore Perry returued from the uorth last week, where she has been confronted every night for weeks by a gigantic line of fire. As Captain Smith expresses it: "The devil's stokers have been stirring up the subterranean sea of flames that is supposed to lie thousands of feet under the Bering's bed, and as a consequence fully twenty of the forty volcauoes in the Aleutian chaiu are uow active."

The line of islands lying between the Beriug sea and the Pacific ocean beloug to the United States, and on them are probably the only active volcanoes lying within American territory. Much has been written of Bogoslav island, which has been throwing up a cloud of steam at times for years, but it was supposed that all the other peaks on this singular line of islands were extinct craters only.

Now, as far as the eye can reach from auy point in the Bering sea, adjacent or even at a distauce from the famous seal islands, the rising smoke and steam can be seen in both directions. The eruption is gcueral, and so very lively that at uight the airy columns take on the reflections of the craters. Nowhere else on the globe can such a sight be witnessed.

In the daytime only the white smoke or steam is visible. As dusk comes and darkness follows the wouder grows. The brighter columns show up in the cold Alaska night first, and as it gets darker other vivid curls of smoke are to be seen at greater distance. Sometimes when the position of the observer is advantageous a dozen or fiftcen of these modern pillars of fire are in sight.

The show of subterraneau force is the most uoteworthy ever observed on American soil. As proof of the mighty power that is at work beneath the islands, a neck of land has been forced up out of the sea between Bogoslav and old Bogoslav, and the two islands are now one. It is a queer looking land. The rocks in this neck are manifestly of volcanic origin, black and smooth in surface as if once melted.

The *Railway Age* says that about six tons of steel rails are annually required for renewals per mile of road, which on the present mileage of the country would represent about 1,080,000 tons. "Adding to this estimate," says the *Age*, "which is probably within bounds—notwithstanding the increasing life gained from iucreased weight—the requirements for some thousands of miles of new construction yearly, the low average of one hundred tons to the mile, it is evideut that the rail mills will continue to find occupation."

To get a practical fluid with which to write on glass dissolve 36 grammes of sodium fluoride and 7 grammes of potassium sulphate in 500 grammes of water. In a separate vessel 14 grammes of zinc chloride are to be dissolved in 500 grammes of water, and 65 grammes of hydrochloric acid are to be added to the solution. Immediately before using equal parts of the two solutions are to be mixed and applied to the glass, either with a pen or a peneil.

Manganese is reported abundant in the French Congo, being met with under three different circumstances, in the copper mines, in the laterite, in the form of *acerdes*, constituting a coat, and sometimes a seam, underlying the ferruginous strata, and also in the bed of the Kanda torrent, where large blocks of conglomerate were fouud, enclosing quartz pebbles surrounded by ferruginous cement containing $Fe^2 O^3$ 21 and $Mn^2 O^3$ 70.5 per cent.

The metric system of weights and measures is to be obligatory in Mexico from September 16th, 1896. This system has been used in the government departments of Mexico for some time past, but a decree recently passed makes it the sole system throughout the republic, and will make an end of the various old Spauish measures hitherto in vogue in ordinary business transactions.



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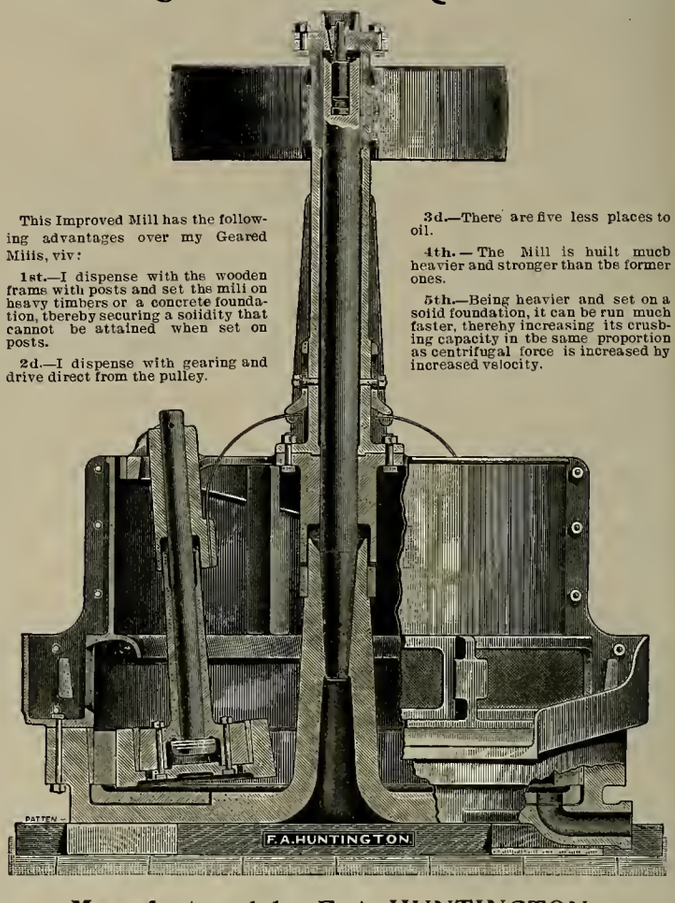
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References:
Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
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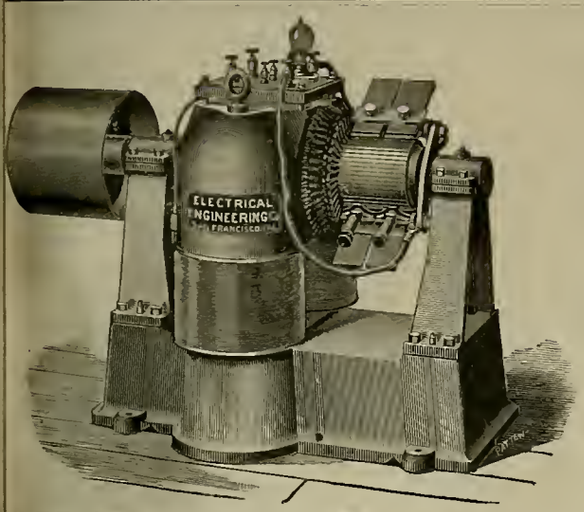
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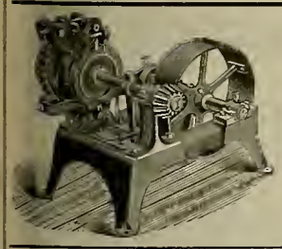
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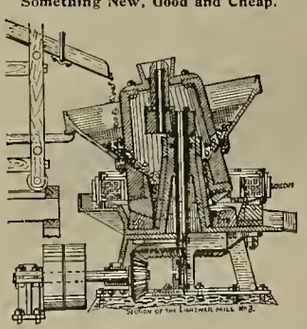


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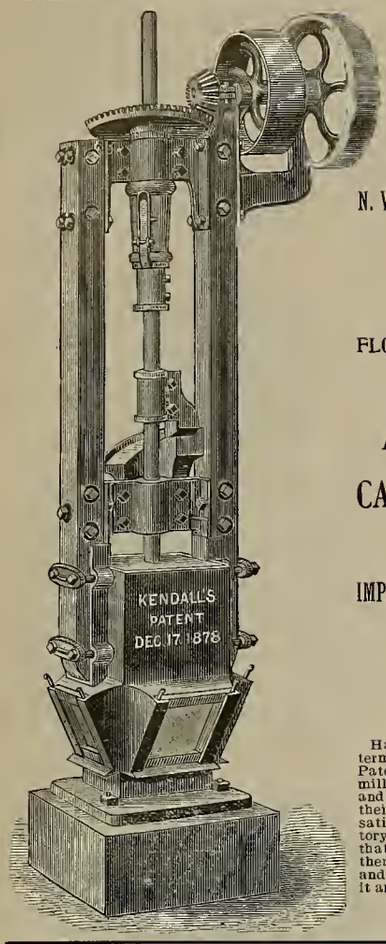
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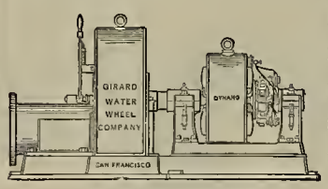
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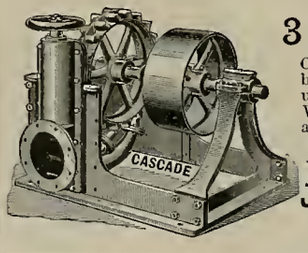
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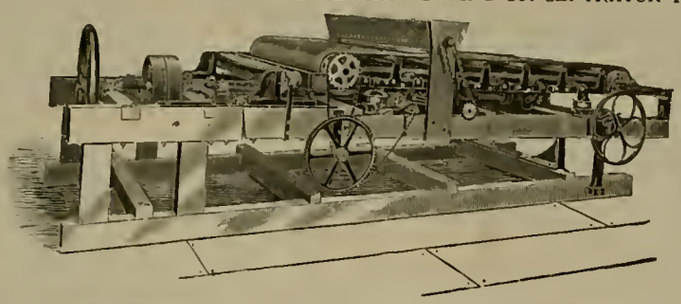
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SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1895.
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Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 91½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully
E. L. BALLOU, Propr. Ballou Reduction Works.

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Established 1860. Reliance Works.

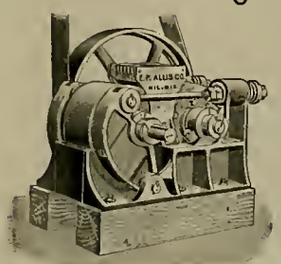
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Cams, Tappets, Bosses, Roll Shells and Crusher Plates.



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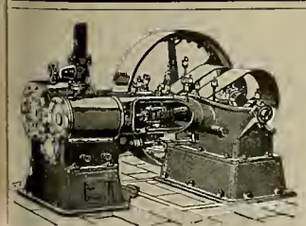


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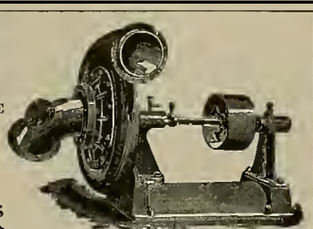
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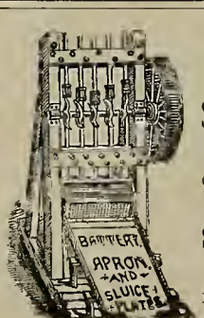
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Cross-Compound Engines and "Whirlpool" Centrifugal Pumps
FOR EVERY DUTY AND CAPACITY.
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Silver Plated Copper Amalgam Plates
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GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

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Every description of work plated. Send for Circular.

Market Reports.

The Markets.

SAN FRANCISCO, Oct. 24. 1895.

Silver did not hold up its last week's prices, though as to the future some very promising statements are made. A New York dispatch says: The best authorities on silver look for a steadily improving demand for the metal for some time to come. The willingness of Japan to accept the indemnity from China in silver contributed laregly to the improvement in its price which has been noted during the last few months, and the accumulation of the metal in London will go on in order to complete the installments of the indemnity at various dates of payment.

Both China and Japan are showing increased inquiry for silver, as the large amounts of the metal distributed by both countries in payment for war material and supplies have been diverted to India and other silver countries.

Mr. Townsend of Hongkong states that silver ordered two months ago has only just been delivered. The silver smelters are said to be sold ahead for two months.

A Washingtou dispatch says: All silver coinage except that of suhsidiary silver has been ordered suspended after November 1 by Secretary Carlisle. In carrying out this policy the New Orleans mint will be practically closed and dismautled after that date.

Secretary Carlisle has for some time heen considering the advisability of stopping all silver coinage except that of suhsidiary coins. Since he has heen head of the Treasury Department only 4,382,224 standard silver dollars have been minted. Since July 1 last only ninety standard silver dollars have heen coined. The total coinage of silver under all acts amounts to $423,289,307.

The treasury now holds 137,644,000 fine ounces of silver bullion purchased under the Sherman act, the cost of which was $124,080, 323, with a coining value in silver dollars of $177,964,000. If this hullion were coined into silver dollars the profit to the Government on its coinage would be nearly $54,000,000, which sum could he paid out for the ordinary expenses of the Government or against which silver certificates could he issued.

The principal effect of the action taken by Secretary Carlisle is to convert all the silver hullion held hy the Government into gold obligations under the parity clause of the Sherman act.

Secretary Windom, in 1891, construed the law to mean that all the Sherman notes issued against hullion were redeemable in gold. This construction of the law was concurred in hy his successors, Secretary Foster and Carlisle, and has been in practical operation during the past four years. Under it $76,193,522 has been redeemed.

The coinage of silver hullion into standard silver dollars operates to prevent Sherman notes heing issued, and silver certificates issued against the standard silver dollars are redeemahle only in silver. Thus, from the same base (silver hullion), the Sherman notes become gold ohligations, and silver, coined into standard silver dollars, and silver certificates, issued upon them, become silver ohligations.

The suspension of the coinage of standard silver dollars therefore leaves the silver hullion free from any other liahility of conversion into silver obligations. The closing up of the New Orleans mint leaves only the United States mints at Philadelphia and San Francisco in operation. At these miuts only gold and suhsidiary silver will hereafter be coined, unless Congress should direct to the contrary and its action he approved hy the President.

New York Metal Market.

NEW YORK, Oct. 24.–PIG IRON—Southern, 12@14.50; Northern, 12@14.00.

COPPER — Brokers', 11¾c; exchange, 12c.

LEAD—Brokers', $3.15; exchange, $3.35.

TIN—Straits, 14.70@14.75c.

SPELTER—Domestic, $4.10.

New York Silver Prices.

NEW YORK, Oct. 24.— Following are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.
Friday	31	67⅞	12 00	.....
Saturday	30¾	67⅜	11 75	3 15
Monday	30¾	67⅜	.....	3 15
Tuesday	30⅝	67	.....	.....
Wednesday	30⅝	67	12 00	3 15
Thursday	30⅞	67⅞	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.87½
London Merchants	$4.86
London Sight Bankers	$4.88¾
Refined Silver, per ounce	67⅝c
Mexican Dollars, nominal	55c

San Francisco Metal Market.

COPPER.

Bolt	¼ & 5-16, 20c;	⅜ and larger,	20c
Lake Superior Sheathing	22	@	—
Ingot, jobbing	—	@	18
Ingot, wholesale	17	@	16
Sheet copper	—	@	21

ZINC.

Sheet	9½@		

LEAD.

Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "	"	...	1 45
Buck, Balls and Chilled, do. "	"	...	1 45

IRON.

American Soft	16 00	@18 00	
Pig, per ton	18 00	@20 00	

STEEL.

English, lb	16	@	19

ANTIMONY.

Per lb	—	@	10½

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

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Company and Location.	No.	Amt.	Levied, Delinq't and Sale.	Secretary.
Alpha Con, Nev	15	10c	Sept 30, Nov 5, Nov 28	C E Elliott, 79 Nevada Block
Alta S M Co, Nev	50	10c	Sept 16, Oct 21, Nov 11	J E Jacobus, 309 Montgomery
Gray Eagle M Co, Cal	41	5c	Sept 23, Oct 28, Nov 22	W J Gurnett, 308 Pine
Exchequer M Co, Nev	38	5c	Oct 21, Nov 25, Dec 19	C E Elliott, 309 Montgomery
Nevada Queen M Co, Nev	9	5c	Sept 13, Oct 16, Nov 12	Wm. Bowers, 331 Pine
Occidental Con M Co, Nev	20	10c	Oct 1, Nov 14, Nov 25	Alfred K Durbrow, 69 Nevada Block
Seg Belcher, Nev	16	10c	Sept 12, Oct 15, Nov 4	E B Holmes, 309 Montgomery
Savage Mining Co, Nev	87	20c	Sept 20, Oct 23, Nov 12	E B Holmes, 309 Montgomery

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date
Alpha Con Co, Nev	C E Elliott, 309 Montgomery	Oct 29

PIG TIN.

Per lb	15	@	16 00

QUICKSILVER.

Home trade, per flask	39 00	@	40 —

BORAX.

Refined, in car lots	—	@	5½
Refined, in sacks and barrels	—	@	5¾
Powdered, in car lots	—	@	5¾
Concentrated, "	—	@	4¾

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 50		
Greta	7 50		
Nanaimo	7 00		
Gilman	6 50		
Seattle	7 00		
Coos Bay	5 50		
Cannel	8 50		
Egg, hard	13 00		
Wallsend	7 50		
Scotch Splint	8 00		
Brymbo	8 00		

TO ARRIVE—CARGO LOTS.

Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

COKE.

Gas Companies'	75c ₱ bbl		
English, to load	9 00	@	10 00
" spot, in bulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —

NAILS.

Wire	$3 50		
Cut	3 25		

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, October 24, 1895.

The market has shown more strength the past week, with an advancing tendency toward the close. It is reported that several outside operators—hrokers and dealers—have pooled their interests, so as to promote a small-sized deal along the entire liue. So far as can he seen, what are known as insiders are not in the market. While this seems to be the case, yet the impression prevails that they are watching with considerable interest the work now under way in several of the mines on the Comstock, and if they feel justified hy a good showing in two or more, then they will come into the market. Large-sized deals cannot now be made on talk, points and write-ups: it takes a good-sized ore development which can be backed hy twenty prices.

Following the announcement that John W. Mackay Jr. had heen thrown from a horse and killed, many timid holders hegan to let go. This selling feeling was encouraged hy the manipulators through cross orders and hear reports, sedulously circulated hy cappers and those used hy the latter. After the street ceased selling, then signs began to he seen that the movement had set in for better figures, so as to unload hefore the long line of assessments are levied. Several companies are carrying their indehtedness, evidently fearing to levy an assessment, for assessments must he collected and this cannot be done when the market has been greatly depressed and the hulls terribly punished through steadily depreciating values. The opinion prevails that the outside pool has been saddled with a large quantity of shares, and it does not pay to hold them, with assessments staring them in the face. To unload, a small-sized deal must he promoted.

The news from the mines grows in interest. While there is much to create a feeling of encouragement that in several mines a sufficient quantity of paying ore will be found to inspire a hull feeling with the more credulous street and chronic traders, yet the more experienced, shrewd and heretofore successful dealers are justly fearful that the results may prove temporary. Feeling this, they think that any hull movement at this time will he followed hy disastrous results to those who have been for years laboring under the pleasing hallucination that there are millions in it. In tbe Alta group Alta is in very interesting ground, with seemingly good prospects ahead. In Overman the work is still heing doue in a half-hearted way, as if the management feared that there is a ghost ahead and did not wish to discover it as yet. In Belcher, Seg. Belcher and Crown Point the work is in the right direction. Kentuck continues to prosecute work, which eats up the surplus money, hut which is not expected to yield up anything more than an assessment. In Confidence and Challenge the work grows in interest. If the expectations of the hetter informed are realized it ought not to create surprise if good news should come to hand at any time. The north lateral drift, noted last week, is said to he in Cballenge ground. It is reported on the street that the intention is not to crosscut the lode until connection is made with the Cou. Imperial west drift. In Confidence the west drift run from the surface tunnel level is, hy private advices, said to he in ore; hut private advices are not always safe to follow. The work in Yellow Jacket is essentially unchanged. Both Con. Imperial and Alpha's west drifts are being lazily pushed ahead. Even at the progress being made, they ought to strike the west lode either the latter part of next month or else the fore part of December. In the middle group of mines the work is about of the same character as that heretofore made puhlic, viz., stringers, streaks and narrow lodes are heing followed with the hopes of good results. In prosecuting the work ore is extracted. The work in Gould & Curry and Best & Belcher is unchanged since last reports. In Con. Virginia active and energetic work is heing done on several levels. At the annual meeting the superintendent's report for the fiscal year ending October, 1895, was as follows: Worked at the Morgan mill, Carson river, Nev., 10,255 tons and 50 lbs. of ore; value per railroad car sample, $57.56 per ton, 83 30-100 per cent of assay value; value per battery sample, $55.10 per ton, 87 02-100 per cent of assay value; hullion yield, $250,-730.33 gold, $241,077.31 silver; total, $491,-807.64; hullion from granulations, slag and sweepings, $1096.10, shipped to San Francisco; assay in gold, $24.94; silver, $30.15; total, $55.10 hattery; yield in gold, $24.44; silver, $23.50; total, $47.95 yield.

This is a very gratifying and encouraging report, for it shows that the ore was well handled in the interests of shareholders. The work in Ophir, Mexican, Union and Sierra Nevada is heing closely watched by miners. It is stated that there is a prospect that West Con. Virginia will secure from Con. Virginia the use of the old shaft so as to have a diamond drill run to the west for the west lode.

From the outside mines, Bodie and others, the news is unimportant. Work on the Brunswick lode seems to he pushed with more energy.

The lowest and highest prices paid on regular call from Oct. 17 to Oct. 24, inclusive, were as follows:

Mines.	Lowest.	Highest.
Alta	$ 16	$ 18
Alpha	08	12
Andes	34	38
Belcher	44	49
Best & Belcher	82	60
Bodie	26	28
Bullion	11	13
Bulwer	06	.....
Caledonia	10	11
Challenge	52	60
Chollar	44	46
Con. Virginia	2 40	2 50
Con. Imperial	03	.....
Confidence	1 40	1 65
Crown Point	36	39
Exchequer	03	.....
Gould & Curry	42	43
Hale & Norcross	1 30	1 45
Justice	05	.....
Kentuck	07	09
Mexican	62	66
Mono	08	.....
Occidental	14	.....
Ophir	1 35	1 45
Overman	11	.....
Potosi	55	60
Savage	30	33
Seg. Belcher	13	.....
Sierra Nevada	86	92
Union	69	71
Utah	09	.....
Yellow Jacket	38	41

The following illustrates the changes of the week:

Mines.	Oct. 17	Oct. 24
Alpha	$ 08	.....
Alta Consolidated	17	.....
Andes	34	$ 36
Belcher	46	47
Best & Belcher	84	90
Bodie	26	35
Bullion	.....	.....
Challenge	60	60
Chollar	45	48
Confidence	1 65	1 65
Consolidated California and Virginia	2 40	2 80
Consolidated New York	.....	.....
Crown Point	37	39
Exchequer	03	.....
Gould & Curry	42	.....
Hale & Norcross	1 35	1 50
Justice	.....	.....
Mexican	64	67
Ophir	1 40	1 60
Overman	12	.....
Potosi	57	62
Savage	31	53
Sierra Nevada	91	96
Union	72	73
Utah	.....	10
Yellow Jacket	38	38

San Francisco Stock Board Sales.

SAN FRANCISCO, Oct. 24, 1895.

9:30 A. M. SESSION.

400 Andes	35	200 Confidence	1 60
500 Best & Belcher	85	600 Hale & Norcross	1 45
100	84	200 Mexican	66
800 Bodie	35	300 Ophir	1 50
100 Challenge	59	200 Sierra Nevada	93
450 C. C. & Va	2 55	300 Utah	09
250	2 60	100 Yellow Jacket	37
10	2 50		

SECOND SESSION—2:30 P. M.

100 Andes	36	100	39
200 Belcher	47	100 Hale & Norcross	1 50
800 Best & Belcher	90	200 Mexican	67
200	89	100 Ophir	1 55
100 Bodie	33	300	1 60
400 Challenge	60	300 Potosi	62
200 Chollar	48	500 Savage	53
400 Con Cal & Va	2 75	300 Sierra Nevada	96
50	2 80	600 Union	73
50 Confidence	1 65	300 Utah	10
100 Crown Point	38	400 Yellow Jacket	38

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.–Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 25) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	234	5,000	$500 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	282	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	322	32 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	900	90 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	551	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4,000	400 00

And in accordance with law and an order of the Board of Directors, made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

SONORA EXTENDED MINING CORPORATION.–Location of principal place of business, San Francisco, California. Location of works, Tuolumne County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 3) levied on the 25d day of August, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
R. Risdon	77	1,170	$ 29 25
R. Risdon	100	48	1 20
C. T. Morrison	78	450	11 25
C. T. Morrison	79	450	11 25
C. T. Morrison	101	38	95
C. T. Morrison	504	1,000	25 00
George Strant	506	3,500	87 50
Jay Deming, Trustee	11	4,000	100 00
E. M. Thompson	111	117	2 93
J. J. Nachtrieb	64	3,385	84 62
J. J. Nachtrieb	99	141	3 52
T. C. Arnold	72	1,890	47 25
T. C. Arnold	109	79	1 95
T. C. Arnold	505	2,000	50 00
G. A. Carter, Trustee	76	3,150	78 75
E. M. Thompson, Trustee	59	1,350	33 75
E. M. Thompson, Trustee	60	1,440	36 00
E. M. Thompson, Trustee	88	250	6 25
John H. Neale	110	131	3 27
John H. Neale	508	2,000	50 00
L. A. Maison	67	2,640	66 25
L. A. Maison	68	110	2 75
L. A. Maison	107	112	2 80

And in accordance with law, and an order from the Board of Directors, made on the 25d day of August, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, No. 213 Jackson street, San Francisco, California, on MONDAY, the 28th day of October, 1895, at the hour of 3 o clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

C. A. STRATTON, Secretary.

Office, 213 Jackson Street, San Francisco, California.

Notice of Assessment.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 6r t (1st) day of October, 1895, an assessment (No. 20) of Ten (10c) cents per share was levied upon the capital stock of the Corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room No. 63, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fourth (4th) day of November, 1895, will be delinquent and advertised for sale at public auction, and unless payment is made before will be sold on MONDAY, the twenty-fifth (25th) day of November, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 63, Nevada block, No. 309 Montgomery street, San Francisco, California.

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WESTERN AMERICAN
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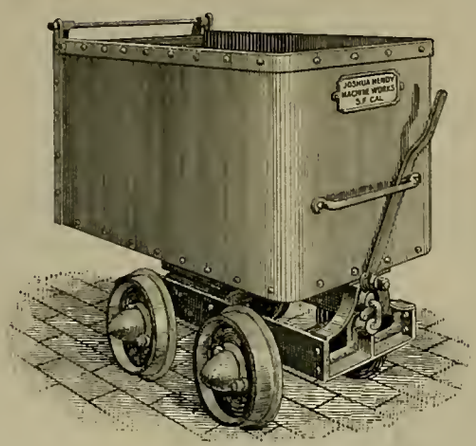
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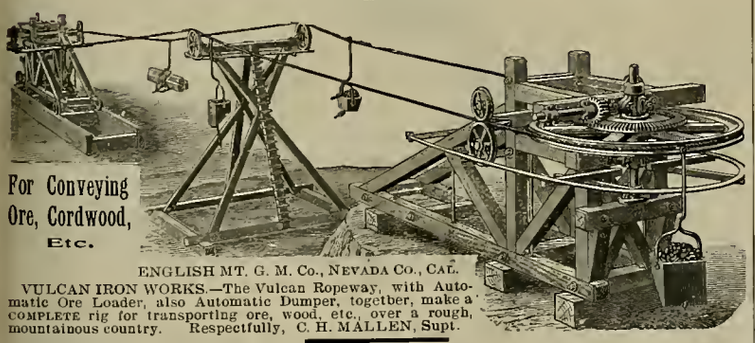
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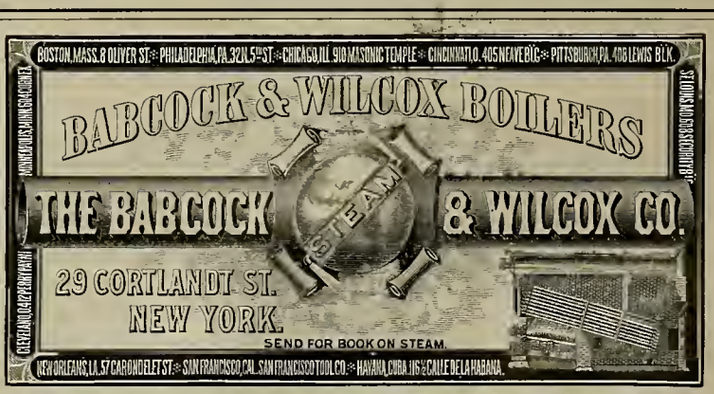
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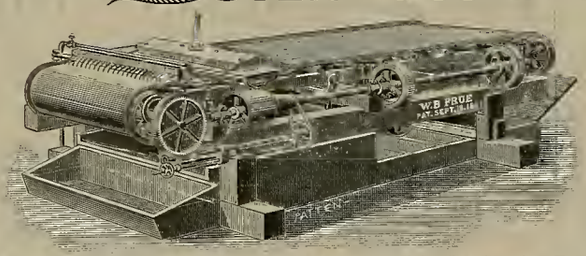
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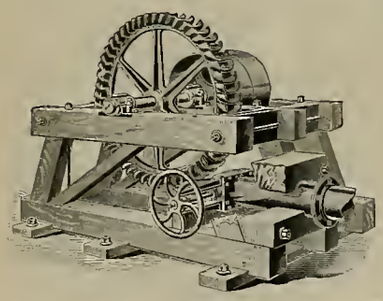
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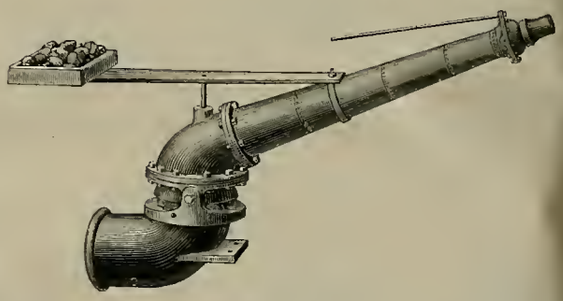
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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 18. SAN FRANCISCO, SATURDAY, NOVEMBER 2, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

A Prominent Home Industry.

The mineral wealth of our State comprises great non-metallic resources but partially developed. This journal has devoted considerable space to notices of the slate, granite, marble, onyx, travertine, and other building material which abound within the confines of the commonwealth, and this week gives place to brief reference to a prominent home industry.

In the city and county of San Francisco is a rock quarry which produces building stone of excellent quality, owned and operated by Gray Brothers. It is metamorphized sand stone, weighs 178 pounds to the cubic foot, being 10 pounds heavier than granite, and stands a great compression strain.

The following is an analysis of this blue silicate of quartz, recently made by Thomas Price & Son, from a sample from the quarry, corner Green and Sansome streets:

	Per cent.
Silica in the form of quartzy material, with a small quantity of mica	87.15
Oxide of iron, with a little sulphide of iron	2.35
Alumina	4.10
Water and carbonic acid	1.60
Undetermined (composed of lime, magnesia and alkalies)	4.80



FIG. 1 — WEST FOUNDATION WALL OF NEW FERRY DEPOT.

There is another quarry of the same rock at 26th and Douglass streets. The value of this rock for building purposes is beginning to be understood. On page 285 is illustrated the office building of the Golden Gate Park Commissioners, now in process of completion, the first building in San Francisco constructed with stone from within the city limits.

Our city is largely built of wood, but it is probable that the value and utility of stone will be given recognition commensurate with its merits. The Parrott building, on Market street, opposite the Baldwin Hotel, the finest edifice in San Francisco, shows what possibilities lie in that direction.

Crushed stone for road building, broken rock for macadam, concrete work for foundations, and artificial stone sidewalks are also furnished in large quantities by the Gray Bros., who employ over 500 men in this city and Los Angeles. Figs. 1 and 2 illustrate the character of the concrete foundations furnished for the new ferry depot at the foot of Market street, this city, which is now in course of construction.



FIG. 2 — FOUNDATIONS FOR NEW FERRY DEPOT.

The stone industry is an important one in this country. The quarry value of the stone produced in 1894 was $37,377,816. Not all this, of course, went into buildings. Of the granite $2,254,587 was for paving, of the slate $489,186 was other than roofing, and of the limestone $520,842 was used for flux. In all $3,294,615 of the quarry output and an undetermined part of the limestone, which was used in road-making, was employed outside of building in 1894, which was a poor year. The aggregate in 1894 was three-quarters of the amount in 1892, $48,706,625; 1890 had an output of $47,000,000, and 1889 of $42,807,706. In 1880 the aggregate was $18,356,055, so that 1894, a poor year, doubled 1880, a good year fifteen years earlier. No statistics of this industry are collected for foreign countries, but its amount here is probably larger than that of all continental Europe put together. This is known to be true of our aggregate mining product, metallic and non-metallic.

In '94 Pennsylvania's total was $5,245,507: the largest product of any one State. Ohio is next with $3,510,511, and Vermont third with a product of $3,461,332. About half the granite comes from New England, half the sandstone from Ohio, half the marble from Vermont, and Illinois and Pennsylvania together furnish a third of the limestone. The value of the yield of this State was very small in proportion to the extent of the commonwealth and the great diversity of its non-metallic mineral resources.

ALL railroad records for speed were broken on the 24th ult., by a train on the Lake Shore and Michigan Southern railroad, which ran from Chicago to Buffalo, 510.1 miles, in 481 minutes 7 seconds, an average of 63.3 miles per hour. This time included stops. Exclusive of stops the run was made in 470 minutes 10 seconds, an average speed of 64.98 miles per hour. The New York Central's record of September 11th was an average speed of 63.61 miles an hour, including stops, and 64.26 miles an hour, exclusive of delay. The east coast record on the Great Northern road of England from King's Cross to Aberdeen is 523 miles in 512 minutes, or 60.3 miles per hour. The west coast record on the London and Northwestern is 540 miles in 512 minutes, or 63.20 miles per hour. The record-breaking train from Chicago to Buffalo went on to New York City over the New York Central, and made a new record between New York and Chicago, the entire distance of 980 miles being made in 17 hours 45 minutes and 23 seconds. Chicago men on board had in their pockets that morning's papers. This was the first time that a regular edition of a Chicago morning paper had been read in New York City on the day of its publication. The train was made up of three coaches, engine and tender. The coaches weighed 304,500 pounds. The weight of the engine and tender was 184,000 pounds, making the total weight of the train 488,500 pounds.

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J. F. HALLORAN.....General Manager

San Francisco, November 2, 1895.

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AT a meeting in Spokane, Wash., last week the Northwest Mining Association, resolved: "That we fully and heartily endorse the action of the California Miners' Association held in San Francisco, commencing on the 14th inst., and congratulate them on the good work they have done."

SOMETHING new in the mining world is furnished by the listing on the Boston Stock Exchange of the stock of the newly incorporated Rawhide Mining Co. of West Virginia. The Rawhide mine in Tuolumne Co., this State, is a dividend-paying concern, and the listing of a dividend-paying California gold mine in any American city is so unusual an event as to attract notice.

THE fact that this country pays an annual tribute to Italy of $2,000,000 for sulphur has attracted the attention of Ohio men to the sulphur deposits of Louisiana, which are considered susceptible of great development. In this connection it is worthy of note that the sulphur beds of Lower California furnish a fine product and can doubtless be developed into a paying coast industry.

THE South African gold fields are of commercial importance to California and the coast. They furnish a market for California mining machinery, Oregon lumber, and have so far given employment to over one hundred skilled California mining men at annual salaries ranging from $2500 to $60,000. The predicted crash in South African mining stocks will have no more relation to the prosecution of gold mining than the bursting of similar bubbles on this coast had on the actual business of mining.

CONSIDERABLE is asserted regarding the ability of electricity to succeed steam as a transportation motor; but when, as was demonstrated last week, one can leave Chicago and be in New York in time to witness the close of a theatrical performance in that city on the evening of the same day, it must be conceded that the steam locomotive is not likely to become obsolete. An engine and train in a most remarkable run on the 24th of last month, on the Lake Shore and Michigan Southern Railway, between Chicago and Buffalo ran one mile at the rate of 92.3 miles per hour. These statements sound incredible, but the facts as stated here and on the first page of this issue are precise and authentic.

WERE the cases to be paralleled, and an era of speculation in gold mine stocks started here, equal in extent to that in London and Paris, the facts, so far as California is concerned, would justify even greater exploitations here than those now going on in what is styled "the Kaffir Circus." It is a fact worthy of prominence that the few dividend-paying gold properties in South Africa to-day are exceeded in that capacity by California gold mines. Were South Africa to possess a Utica, Kennedy or Rawhide profit producer, the law of proportion suggests that the British manipulators of South African mining snares could absorb two billion dollars as easily as they have absorbed one billion in disposing of stock.

ELSEWHERE in this issue brief notice is accorded the greatest contribution to science ever given by a government—the survey of the thirty-ninth parallel of north latitute, just completed. The commercial idea was secondary. The prime object was to accurately and precisely determine the figure of the earth. North and south lines had largely contributed to this final result, but for absolute exactness in astronomical calculations an east and west line of the farthest possible extent had to be run. The Thirty-ninth parallel from Point Arenas to Cape May, New Jersey, was chosen as the stretch of territory best adapted for the work, and the United States government has now finished the longest line ever surveyed in this world, or probably any other. The earth is, in general, an oblate spheroid; its exact shape is figured on the theory that the globe was once a molten mass; the number of its diurnal revolutions and its centrifugal force form the factors of computation, but exact data rendered an extensive triangulated survey necessary where accuracy of outline was desired. To the coast and geodetic survey is due great praise for the successful completion of the work.

THE anti-debris zeal of some of the valley papers leads them to say many things that have no foundation in fact. Like the Sacramento *Record-Union*, they iterate and reiterate till they themselves believe the fanciful creations of their disordered imaginations. To seriously notice such regular emission of misstatements would be to accord a substantial existence that such airy vagaries lack. A sample statement may be noticed wherein the Marysville *Appeal* editorially asserts that hydraulic debris has filled the channel of the straits of Carquinez six and one-half feet, and because of that that Major Heuer has called upon the government to dredge the channel to enable its ships to visit the navy yard for repairs. In answer the Vallejo *Chronicle* says: "You are saying something that is not so. The channel between Vallejo and Mare Island from Carquinez straits to some distance above the navy yard is as deep as it ever has been. It is not so wide, perhaps, for the reasons that the deposits carried into the Napa river by the heavy rains in winter find lodgment on the banks, and it is the mud that has accumulated inshore in this way that is now being dredged out. Dredging is a common thing at all navy yards, but it cannot be said that hydraulic slickens is filling up the rivers and bays on which Eastern navy yards are located."

ARIZONA, Montana and Idaho have recently passed mining laws that make many important changes in the required modes of procedure. The Arizona act has been given considerable notice in these columns. As becomes a territorial ward of the nation, Arizona has not attempted to override the federal statutes. With much that is good in the recent Montana and Idaho mining legislation, is mingled some provisions that may conflict with United States statutes. It is evident that till courts of final resort decide on some points, the business of mining lawyers will be augmented in both States. Among the good requirements of both the Montana and Idaho new legislation is that at least 100 cubic feet of work development be done on a lode claim sixty days after location in Idaho, ninety days in Montana. In both States an affidavit of the annual assessment work is called for, the Montana act saying such affidavit "may" be filed, the Idaho law specifying that it "must" be filed. In general, the Montana legislators seem to have been more ambitious, with the ambiguity so often an accompaniment; the Idaho legislators evidently meant to leave little to litigation, and to make matters as unpleasant as possible for the individual who will neither work his claim nor give it up, but who hangs on with the merest shadow of a possessory title, to the detriment of the region he infests.

Several Questions Answered.

As the year draws to a close and stormy weather begins, letters of inquiry regarding assessment work are more frequent from tardy owners of claims who have not yet done their assessment work. Several can be answered by the statement so often found necessary to repeat in these columns, that the regular annual assessment work on each unpatented claim required by law must be done for the current year by January 1st, '96. The suspension applied only to '93 and '94, but does not apply to '95. If the requisite $100 of work or improvements is not done by the 1st of next January, the claim is subject to relocation.

Another set of inquiries relate to a matter that was discussed considerably a year ago, and now comes up again, viz., the recording of the notice of intention to hold or work the claim. If the correspondence received at this office be any criterion, it would seem that the result of failure to comply with the provisions of the suspension act may be troublesome to many.

The easiest way to answer this latter class of questions is to republish the act passed in July '94, which is precisely similar to the one enacted in November '93. Following is the official text of the bill as furnished us at the time by Senator Perkins and Congressman Caminetti:

An act to amend section numbered twenty-three hundred and twenty-four of the Revised Statutes of the United States relating to mining claims.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the provisions of section numbered twenty-three hundred and twenty-four of the Revised Statutes of the United States, which require that on each claim located after the tenth day of May, eighteen hundred and seventy-two, and until patent has been issued therefor, not less than one hundred dollars' worth of labor shall be performed or improvements made during each year, be suspended for the year eighteen hundred and ninety-four, so that no mining claim which has been regularly located and recorded as required by the local laws and mining regulations shall be subject to forfeiture for non-performance of the annual assessment for the year eighteen hundred and ninety-four: *Provided*, That the claimant or claimants of any mining location, in order to secure the benefits of this act, shall cause to be recorded in the office where the location notice or certificate is filed on or before December thirty-first, eighteen hundred and ninety-four, a notice that he or they in good faith intend to hold and work said claim: *Provided, however*, That the provisions of this act shall not apply to the State of South Dakota.

SEC. 2. That this act shall take effect from and after its passage.

Approved July 18, 1894.

It will be seen that a necessary part of the performance was the proper recording between July 18 and December 31, '94, by the claimant or claimants of intention to hold and work the claim.

This journal repeatedly directed attention to the importance of the clause referred to, and on December 15, '94, editorially said:

"The attention of those who have not yet secured the benefit of the suspension act for '94 is directed to the fact that only about two weeks remain, and that by the 31st of this month the claimant or claimants of any mining location, in order to secure the benefits of this act, shall cause to be recorded in the office where the location notice or certificate is filed a notice that he or they intend to hold and work said claim. By so doing they will be exempt from being required to do $100 worth of labor or improvements for the year.

"In answer to several inquiries received during the week it is to be noted that the notice must be *recorded*. It will not do to simply "file" it. In some of the counties of this State the clerk or recorder good naturedly makes no charge, and that is in direct line with the idea of the exemption, but if he demands his regular fee it must be paid. It is not necessary to have it acknowledged before a notary."

In answer to the third set of inquiries regarding the entry of land for gravel pits and reservoir purposes, and granting right of way for pipe lines, it is stated that a bill passed both houses of Congress last December, authorizing such entry and granting such right of way. Under this law any citizen of the United States, or ditch company, or water company, may buy lands for reservoir purposes not to exceed 160 acres of unoccupied land, at a price not less than $2 per acre. When the purchased lands are in a mining district they are not to be considered mineral lands, but the patents do not authorize the purchasers to extract mineral therefrom, reserving that right to the Government. Non-use of the land so purchased for two years constitutes forfeiture.

Concentrates.

THE *Tidings* itemizes over $125,000 in buildlng improvements in Grass Valley in '95.

IN the Witwatersrand, South Africa, district there are at present 3835 stamps at work.

A WARDNER, IDAHO, subscriber asks: "What is the deepest drill hole ever put down?"

THE owners of the App mine, Amador Co., intend to add forty stamps to their present mill.

THE *Free Press* declares that Shasta county mines will employ 20,000 men in less than five years.

THE Illinois Mining Co. has fifteen men at work in their mines at Placeritas, near Prescott, Ariz.

SPOKANE OWNERS have paid Eastern stockholders in the Josie Mining Co. $37,500 for their interests.

THE Blossom mill, near Ogilby, Cal., is reported turning out from $8000 to $10,000 per month with ten stamps.

COMPLETION of the line to Mariposa gives telephonic communication to that town via Stockton and Merced.

UNDER the new Utah State constitution all patented mining claims will be assessed at the rate of $5 per acre.

ACCORDING to the annual report of the Director of the Mint, the ratio of gold to silver during the year was 32.56.

A 60-STAMP mill is to be built at the Jenny Lind mine, in which Supt. T. T. Lane of the Utica is largely interested.

FIVE carloads of ore from the Trail Creek mines passed through Seattle one day last week for the Tacoma smelter.

THE War Eagle mine at Rossland, B. C., will increase its force to 200 men as soon as the new machinery is in operation.

MR. WRIGHT has bought for $60,000 the Black Oak mine, Tuolumne Co., and will work twelve men on eight-hour shifts.

AT Maybert, Nevada county, the Fountain Head Gold Gravel Mining Co. has incorporated to work the company's claims there.

IT is estimated that the silver output of Utah for the current year will reach 8,000,000 ounces, as against 6,500,000 ounces in '94.

THE average expense of working the largest and best conducted of the Witwatersrand, South Africa, mines is represented to be 70 per cent of the output.

MONTANA PAPERS say John S. Miller of Helena has sold the Diamond mine at St. Louis near Townsend for $3,000,000. The report is unconfirmed.

THE exportation of ores from the State of Sonora, Mexico, via Nogales, for the months of July, August and September, aggregated 1,274,000 pounds.

THE Los Angeles Petroleum, Smelting and Mining Company has incorporated for the purpose of carrying on a general mining and smelting business.

FURNACEVILLE, one of the old pioneer camps of Shasta county, is again coming to the front and will doubtless be favorably heard from before long.

J. B. HOLMES has secured sufficient money to pay off the indebtedness of the Cerbat Company and will immediately start up work on the mine and mill.

ABOUT 85 per cent of the money invested in Cripple Creek, Colorado, mines is Denver capital, the remainder from California, Massachusetts and New York.

THE Montana *Miner* says the resumption of work by the Great Falls smelters means employment for 120 men in the mines and a payroll of $20,000 a month.

THE St. Mary's Mining Company has incorporated in Spokane, Wash.; capital, $500,000. The claim is in Trail Creek district, B. C., and adjoins the Ottawa.

A NEW 20-stamp mill is in process of erection at the Denver mine, Forbestown, Butte Co. A similar sized mill is to be put up at the Carlisle mine, near Enterprise.

THE Jacksonville *Times* says that Geo. Wait, who is mining on the middle fork of the Applegate, in Jackson Co., Oregon, is taking out gold that goes over $19 to the ounce.

FOR the first time in fifteen years the Peck mine, Arizona, is unwatered, and the present proprietor, A. Falso, now expects to keep that old bullion producer up to its old time record.

THE Union Gold Mining Company has incorporated in this city; G. R. Fletcher, W. B. Hamilton, R. Harold, Jr., and M. J. Green, incorporators; capital stock, $2,000,000, fully subscribed.

ONE year ago the Yellow Jacket, Lemhi, Idaho, had ten stamps in operation: now there are forty dropping and twenty more will be added this winter. S. R. Thompson is superintendent.

THE exaggerated reports of great mining activity in Globe, Ariz., appear to have traveled on the wind, and as a consequence miners are flocking there from all quarters, from Oklahoma to the Pacific.

THE Victor Mines and Land Co. of Victor, Cripple Creek district, Colorado, paid its sixth monthly dividend on the 21st ult., the amount being one-half cent per share, or $3000, making $18,000 paid to date.

ARIZONA papers say the hills are full of miners doing assessment work. The new Arizona law is getting in its work, and the chances are that more assessment work will be done this year than for many years past.

ELEVEN MEN with a three-stamp mill and supplies have gone from Redding to Harrison Gulch, in the southwestern part of Shasta county, to work a newly discovered ledge. W. R. Conant of Castella has charge of the enterprise.

THE Fool's Gulch property, near Phœnix, Ariz., recently sold to Eastern capitalists for $40,000, is reported to be giving great promise under development. If the prophecies of old miners prove true, it will be a large camp before long.

IN his annual report the superintendent of the Con. Cal. & Virginia says that the output of the mine for the twelve months ending September 30, 1895, was 10,255 tons of ore, extracted from the 1650 level down to the sill floor of the 1750 level, which amount of ore yielded $401,807.64, being an average yield of $47.95 per ton. The bullion carried $250,750.33 in gold and $241,077.31 in silver. The coin value of the bullion was $364,556.51.

CHARLES BUTTERS, an old California miner, is now in charge of the Rand Central Ore Reduction Co., equal in extent of output to any ore working institution in the world. Under his supervision a monthly average of 33,000 tons of ore and tailings is treated.

CONTRACTS with the large silver producers run with the smelters to the first of the year. In many of these contracts the allowance for silver and lead and for treatment charges is fixed, regardless of quotations, so that the weekly figures apply mainly to small lots of ores.

OLIVER ROBERTS, who has just returned from Silver Lake, Douglas county, Nev., declares "there's more gold in Buckeye canyon, near Carson, than in any other one place on earth." He thinks there will be considerable activity there when the snow melts next spring.

CHAS. ALLENBERG, general manager Altoona Mining Co., says that the company has about 100 men employed producing 20 to 25 flasks of quicksilver daily. A new shaft has been sunk from the present level 65 feet and will be continued 210 feet below the lowest level, giving a depth of 430 feet.

THE allegation that a new miners' association is in process of formation, composed exclusively of hydraulic miners, is of that style of information usually called "newspaper talk." The miners realize that "in union is strength," and that the motto of those opposing them is "divide and conquer."

C. B. RICHARDS, a Colorado smelter owner, and C. J. Josselyn of San Diego have bought a controlling interest in the Silver King and Standard mines, carrying gold, silver and copper, in White Gold Basin, Picacho district, San Diego county, and propose to immediately erect reduction works.

THE Con. Cal. & Virginia Mining Co. has arranged with the Nevada bank for sufficient money, when needed, to carry it without levying assessments while exploratory work on the 1000, 1650 and 1750 levels is being done. This month there will be another large accumulation of ore, so that the Morgan mill may again be started.

RENEWED interest is taken in the report that one of Tuolumne's great gold producers—the Rawhide mine, owned by Nevills, Martin and Ballard—is incorporated on a $5,000,000 basis, the new concern being known as the Rawhide Mining Co., of West Va., and is listed on the Boston Stock Exchange, along with the Santa Ynez, the Merced, and others.

THE Butte Bimetallic Union has collected $7519, nearly one-half the amount assessed to the State of Montana. The Colorado Co. and the Boston & Montana Co. each subscribed $1000, and the Butte & Boston, Montana Ore Purchasing Co. and A. W. Clark $500 each. C. C. Rueger, for Walkerville citizens, handed in $110.50, and the First National bank donated $250.

SAN FRANCISCO silver shipments to the Orient in '95 show that the natural laws of trade work out their own conclusions. For the first nine months of the year specie went across the Pacific from this port to the aggregate value of $19,981,421; London specie shipments for the same time to the east aggregated $24,426,035. For the corresponding nine months of '94 the London shipments were $37,015,850.

THE Supreme Court of New Mexico has rendered a decision in favor of the Maxwell Land Grant Company in the suit of the Bent heirs, involving a twelfth interest in the Maxwell land grant, valued at $500,000. This celebrated case has been in the courts over thirty years. It grew out of a claim of the children of Gov. Charles Bent, who was killed in the revolution of 1847 at Taos. The present decision quiets the title in the Maxwell Company.

AT Plymouth, Amador county, the cost of mining and delivery of ore to the mill averages about $1.85 per ton, which includes the cost of necessary prospecting and opening of ore reserves. Milling is done for from 70 to 90 cents per ton, including concentrating, in mills having a capacity of 25 tons or more per day. The local estimate is that ore bodies averaging three feet in thickness and containing only .15 oz. gold, or $3 per ton, can be worked profitably.

FIFTY-FOUR new gold mining companies organized in this State in '94; so far in '95 fifty-eight new mining companies have filed articles of incorporation. It is believed every one of those organizations have incorporated for the bona fide object of working gold mining properties. There is no other industry in this or any other State that is exhibiting such activity, and the simple fact without any elaboration illustrates the present vitality of the California mining industry and its business importance.

THE sulphur deposits in Calcasieu county, La., are being developed by Cleveland, O., men. One hundred tons of sulphur per day are being raised to the surface through quicksand. It is thought the product of the mines will be great enough to supply the world with a fine quality of sulphur, and the United States will be emancipated from the Sicilian product. This country has been paying $2,000,000 annually to Sicily for sulphur. A big drop in price and an equally large increase in sulphur consumption is predicted.

THE Supreme Court of the State of Nevada decides that a partnership agreement to locate mining claims being within the statute of frauds, one partner cannot claim an interest in a claim located by another under an oral agreement that they should be partners in all such locations, when no trust arises because partnership capital was employed in locating the claim. Equitable relief may be given against the partner holding the legal title when the property has been acquired by partnership capital upon the theory that a resultant trust exists—a trust arising by operation of law, and within the exception of the statute.

THE Kaslo & Slocan Railroad is finished and will be accepted by the Canadian government this week. One of the richest mining regions in the Northwest will be given closer connection with the outside world. The road extends from Kaslo, on Lake Kootenay, to Cody, thirty miles to the southwest, and penetrates a country literally lined with mines. The list shows the Black Fox and Montezuman, five miles from Kaslo; Texas and Eureka, sixteen miles; Whitewater, Miner Boy and Lucky Jim, twenty-one miles; Washington, Surprise, Antoine, Best, Rambler, Dardanelles group and R. E. Lee, twenty-four miles; Slocan Star, Ruth, Wonderful and Wills group, at Sandon; Last Chance, Noble Five, Deadman, Reco, Bluebird and American Boy, at the end of the track. The new railroad will be operated by a company headed by John Hendry of New Westminster, B. C. Connection will be had by boat with the transcontinental lines.

HIRAM EVINGTON and family went to Portland, Or., lately from Silver City, Idaho. Sickness occurred, Evington was unable to find employment, and they were on the verge of starvation. One child died and the father became ill. When hardly convalescent he went to the river and jumped into it to drown, but was rescued by a boatman. An old acquaintance persuaded Evington to go prospecting with him in southern Oregon. He consented and they found a claim which they sold for $15,000. Next day his wife received a telegram from Dubuque, Iowa, saying Evington's brother had died, leaving him $8000 worth of property. Now he's glad he's alive.

THOS. FULLEN of the Altaville foundry is reported by the Calaveras *Prospect* to have invented an apparatus for preventing sticks, twigs, grass and other floating rubbish from entering hydraulic or other pressure pipes, which does away with the method of putting racks and sieves at the entrance of these pipes to catch rubbish. It is an overshot wheel the width of the flume, covered with coarse wire screen, and revolving around the section of flume which leads into the sand-box. As rubbish comes down the stream, it drops on this wheel and is cast off to one side while the water passes through the screen and into the section of flume entering into the sand-box.

THE Sacramento *Bee* says that Valentine's rock dam, in Shasta county, built last year under permit, has been carried away by high water, with all the debris that has been placed behind it. The Shasta *Courier* says the statement is just a plain, ordinary lie. The *Courier* further says that the dam near Horsetown is as solid a structure to-day as when accepted by the U. S. Debris Commission; that it retains debris and is as permanent as the eternal hills. It is seven feet high, and seven feet more will be added to it this season, and the mine whose debris it impounds employs only four men, and debris could never injure the river, which is miles distant, even if the dam were not there. It is just as well now and then to show those valley falsifiers up. A cause that depends upon falsehood and misrepresentation is in a bad way.

THE Anti-Debris Association's letter to Hon. Grove L. Johnson, in answer to an inquiry as to what legislation they wish at the hands of Congress, is modest. Congress should at once come to their relief, but they add that hydraulic mining, which has added millions to the wealth of the nation, is a private affair, and of no more concern to the public than any country blacksmith shop. "Any legislation that shall provide for the reopening of hydraulic mines, coupled with the improvement of the navigable streams, we shall oppose with all the means in our power," says this public-spirited association. Congress should protect our interest at public expense, they say in so many words, but we will not submit to share in any tax that shall aid the hydraulic miner. The Calaveras *Prospect* thinks this is patriotism of a new kind, which will probably have due effect upon our distinguished representative in Congress.

THE New York *Financial Record* can always be depended upon for a unique mining item. This week it says: From what is known as the Forks of the Creek to Golden, on the stream known as Clear creek, Colorado, is probably the only placer mine in the world that renews itself as fast as it is worked out. The stream receives the tailings from several thousand stamps pounding on ore above at the mines, and the owners work down one side and let the bulk of the stream run down on the other side. It takes about three years to work the length of the claim. By that time enough gold has been lost by the mills to make good diggings on the other side, and so it keeps up. The sluice boxes, after they are worn out, are put up at auction and the buyer proceeds immediately to make a bonfire of his purchase. One lot we know of cost $150 and made a rather costly amusement; but as the owner realized $700 in gold from the ashes, his fun proved quite profitable.

THE Placerville *Democrat* wants a league of mountain editors formed, especially since the valley press league was started apparently to fight the mining interests. The editors of the mining counties have no desire to make reprisal on the valley editors, but wish to protect mining interests, and at the same time perfect amicable arrangements with the valley people, that no harm may be done them whatever in taking out gold, the main product that makes California at all prosperous. With a proper organization of mountain editors much good may be accomplished and a better understanding arrived at in settling the conflict between the mining and farming sections, to the great benefit of both. The valley people along the Yuba and Feather rivers would stop all kinds of mining throughout the entire State if they could, although professing only to object to hydraulic mining. If the farmers were at the head of a stream and the miners below, they would feel greatly dissatisfied if stopped from letting their irrigating ditches and drainage from farms go into streams.

THE report of Director of the Mint Preston on the production of the precious metals in the United States in 1894 places the production of gold at $39,500,000; the coinage value of the silver production is given at $64,000,000, while the commercial value at the average rate per fine ounce during 1894 of .63479 was $31,122,000. The production of silver in the United States decreased from 60,000,000 ounces in 1893 to 43,500,000 in 1894. The total gold imports for the year were $21,359,607 and the total exports $101,988,753. The exportation of gold is credited with having decreased the total stock of gold coin in the United States from $663,013,158 on January 1, 1894, to $577,182,792 on January 1, 1895—a loss of $86,730,366. A fairer statement is that of the total metallic stock of the United States at the corresponding periods, this, of course, including the bullion held by the Government and privately. It shows $624,289,758 in gold coin and bullion on January 1, 1895, against $668,998,964 on January 1, 1894. The contraction in the amount of money (paper and metallic) in circulation between the same periods amounted to $103,428,783, due mainly to the exportation of gold. Director Preston believes that not less than $50,000,000 in gold was taken from the world's production for industrial consumption in 1893, while of silver it is estimated that 663,000 kilograms, of the commercial value of $16,622,980, was similarly used in the same year. He places the world's industrial consumption of gold for 1894 at over $52,000,000, while the consumption of silver he places at over $33,000,000.

The Sampling and Measurement of Ore Bodies in Mine Examinations.

NUMBER II.

By EDMUND B. KIRBY.

SAMPLING ORE "IN PLACE."

1. A large number of small samples for assay, each of which is quickly and roughly taken, are cut from lines distributed at small intervals over the area of each plane section.

2. A limited number of large samples for assay, each carefully and laboriously taken, are cut from lines distributed at wider intervals.

3. Mill-runs. In this system each sample is either sent to a mill where its actual yield is ascertained, or it is shipped to some sampling or smelting works where an assayers' pulp is prepared from it by accurate sample reduction with machinery. The samples are very few in number on account of the time and expense required. In the first case each one must be large so that it may be milled by itself and furnish enough product to clean up. In order that a sample may be representative, it is generally composed of ore from several points.

4. Panning in a miner's gold pan or horn. This test is applied to a large number of very small samples, each of which has been roughly taken and pulverized for the purpose on a stone, or huck-board, or in a mortar.

The first system is adopted to save time and expense whenever the second or third is unnecessary. There are many samples to assay, but the work of taking each one is small. It gives correct results only when applied to soft ore bodies where the sample may be cut out easily and uniformly by pick, gad or moil. The method is permissible only when the richest portions of the ore are not too much scattered in spots, streaks, or special layers, and are not too high in grade. In other cases it is applicable to very thin sheets of ore. It is frequently used on sections of probable ore, and for daily working samples in the operation of a mine, or in other cases where a quick, rough approximation is desired. Each sample may be small, requiring reduction to only half or one-fourth its bulk for the final package; again, it is often sufficient to break so little from the point that it may be sent entire to the assay office. There may be a large error in any single sample, but this is balanced in averaging by the great number taken.

The second system is necessary for all hard ore (requiring blasting), and for bodies in which the variations of value are great, or where the richest portions are irregularly distributed. It is always expensive and laborious, but generally the most accurate method, and is therefore most frequently employed. The sample broken is always large enough, from 25 pounds to 50 tons, to correctly represent the variations along the line of its cut, and is reduced to a small package for transportation to the assay office. Each sample is accurate, the error involved in the system being that due to the wide intervals between samples and the small number to be averaged.

The third system of "mill-runs" is rarely adopted unless a mill happens to be close at hand and the ore body is of such size with values so variable or scattered that samples by the second system would be very large (10 to 50 tons), and the work of hand reduction therefore very great. If mill-runs are sent to a sampling or smelting works, the expense and delay is generally greater and the results are more serviceable than those of hand reduction at the mine. Mill-runs are more useful for metallurgical tests than to determine the value of ore in place. For the latter purpose their results are frequently deceptive and they are therefore dangerous in unskilled hands. This is because each mill-run is so tedious and expensive that few are made, and thus but a few scattered points of the ore deposit are tested. If each sample is composed of ore from various points, it is practically impossible to have the right proportion from each one, and the result is also subject to the serious errors of mixed samples. Again, the mill is often metallurgically unsuited to the ore, and it is more difficult to guard against fraud. When it is necessary to use this system, extra money and time should be provided for, and the samples made numerous enough for safety.

The fourth system of panning is restricted to free gold ore and while it is not intended to furnish exact figures of value, it is very useful as an auxiliary method to determine the relative distribution of gold and the limits of pay ore. In the regular operation of a mine it is often used to guide the work, and if checked frequently by assays or mill results, mine foremen sometimes become remarkably expert in judging the exact value from pan tests. This cannot be done with unfamiliar ores, but even then it is generally possible to distinguish roughly between ore above and below pay.

Distribution of Sample Lines.—Each sample is cut along a line, making a trench, or groove, of the same dimensions throughout, and so placed as to cross any principal lines of variation in the grade or character of the ore. The lines of sample cuts are impartially distributed over the area of the plane sections adopted, in positions as nearly equi-distant as possible. The boundary between pay ore and low grade, or waste, is provisionally fixed by judgment. If in doubt about a low-grade streak, a separate sample is made of it. The width sampled is always the width measured.

Taking Samples.—In the first system the sample cuts are shallow, uniform grooves, say three to six inches deep, and generally within two or three feet in length.

In the second system the quantity broken is fixed partly by the length of the line and partly by the distribution of values along it. The usual range is from 50 to 400 pounds. In order to secure reliable averages across a large and spotted ore body the writer has found it necessary to break 25 and even 80 tons of single samples. These extreme quantities, however, were tested by mill-runs. The trench, or groove, is blasted out, and afterwards trimmed to uniform dimensions. Large samples, exceeding say 300 or 500 pounds, may be received upon the bare floor of a level, but when the bulk is less it is handled on canvas. This is protected from injury by covering with loose plank before blasting.

It greatly facilitates the subsequent reduction of the mass broken down to work upon a smooth surface. Thus, where many samples are to be taken along levels, it is best to lay temporary platforms, made of loose plank, beneath the sample points. A platform may be moved and relaid in ten minutes, and for a heavy piece of work three will do for a working force of one assistant and ten or twelve miners. In taking samples down a shaft or winze, a temporary platform is placed at each point. Work done in stopes also requires the use of movable platforms erected in any convenient way.

Samples from Loose Material.—In mine examinations it is frequently necessary to take samples from loose ore, dumps, mill tailings, etc. To obtain a sample of ore which is being extracted, one or more shovelfuls are taken out of each bucket or car, and thrown into a pile to make the sample. In the case of sacked ore, a few pounds are taken from the top of each sack, or when greater accuracy is necessary every second or fourth sack is emptied on the pile. A pile of ore on the dump may be roughly sampled by taking one or more shovelfuls from each one of many points, distributed at equi-distant intervals over its surface. The only safe method, however, is to drive several open trenches or tunnels through the mass, taking, say every tenth shovelful for the sample. For a dump of mill tailings, a boring tool is used, made of a 16-inch piece of two-inch pipe. This is easily carried to the mine and attached to a handle of convenient length. The dump is pierced by bore holes at equi-distant intervals, and the borings from each hole are reduced and assayed separately.

Reduction of Samples.—The reduction of a sample from its original bulk to that of the assayer's package, does not differ in principle from the process followed at sampling and smelting works, but requires less accuracy. Moreover, instead of using machinery and routine methods, the reduction must be made on the spot by hand, upon samples varying greatly in grade and quantity, and under every disadvantage of underground conditions, from showers of water to the cramped quarters at the bottom of some narrow hole. Therefore no two samples are reduced in the same manner, and fixed rules are impossible, so that it becomes necessary to recount with some detail the fundamental principles of the process as applied to underground work. It is not, however, within the purpose of this paper to enter into the many practical details of manipulation, although accuracy in hand reduction depends largely upon skill in these small points.

The process of reduction requires the continual repetition of two consecutive operations. First, crushing to a certain minimum size; second, the impartial selection of a fractional portion of the mass. The latter operation comprises the two consecutive acts of mixing and cutting, these being performed once or several times until the definite fraction desired is obtained.

Whatever final limit of error is permitted for a given sample, it is a rule that at each repetition of this series of operations they must be performed with more care than before. In consequence of this a very large sample requiring many repetitions of the series finally reaches a stage where so much care and accuracy are necessary that handwork is too laborious. At this point the sample, whatever its bulk, should be made up into the final package and sent to the assay office where crushers, grinders, the buck-board, and fine sieves are available for the final operations. Thus the bulk of the final package is fixed by deciding whether it is better to incur the expense and delay of pushing reduction a step or two further at the mine, or, on the other hand, to bear the cost of transporting a greater weight to the assay office. In practice the packages generally range between four and ten pounds, and frequently reach twenty-five and fifty pounds, especially when the assay office is near.

Crushing.—The ore is broken so that no lump shall exceed the maximum size decided upon. Very rich lumps are broken smaller in order to distribute their value. During the final stages of reduction a pair of sieves with ¼-inch and ½-inch meshes are useful to separate out those lumps which require breaking.

Relation of Maximum Size to Bulk.—The instinctive judgment derived from long experience in sample reduction is necessary to promptly decide the maximum size and the fraction to be selected at each series of operations. These must be so taken as to keep the work within the limit of error allowable, and at the same time have it move rapidly. Since this relation of maximum size to bulk depends on several variable conditions, and is never the same for any two samples, it is impossible to illustrate it in a very satisfactory way. The first column of the following table will, however, give an idea of the maximum sizes selected by general judgment for two typical cases of reduction.

TABLE ILLUSTRATING THE RELATION OF MAXIMUM SIZE TO BULK IN TWO TYPICAL CASES OF HAND REDUCTION.

An average ore is taken, containing $10 to $50 per ton, and it is assumed that the richest lumps of full size do not assay more than five times the above value.

	Sizes Adopted in Practice.	Theoretical Sizes as Calculated by Reed's Formula. Maximum Sizes of Lumps (Diameter in Inches) Allowing a Limit of Error of	
		5%	10%
CASE I. Reduction of an 1800-pound sample to 7 pounds by taking one-fourth after each crushing.			
1800 pounds prepared for reduction by crushing to	4 in.	3 in.	3.8 in.
The 450 pounds prepared by crushing to	2	1.9	2.4
The 112 pounds prepared by crushing to	1	1.2	1.5
The 28 pounds prepared by crushing to	0.5	0.75	0.9
And then reduced to 7 pounds.			
CASE II. Reduction of a 300-pound sample to 5 pounds by taking one-fourth after each crushing.			
300 pounds prepared for reduction by crushing to	2.5 in.	1.7 in.	2.1 in.
The 75 pounds prepared by crushing to	1.0	1.0	1.3
The 19 pounds prepared by crushing to	0.5	0.6	0.8
And then reduced to 5 pounds.			

Reed's formula is the result of an effort to find a rule which will express mathematically the effect of the aforesaid conditions for any case. It does this in a very satisfactory manner for the accurate work of sampling and smelting works where the limit of error is 1%, and it is of interest here to compare the above figures taken from practice with its theoretical results. The other two columns therefore show the sizes calculated from the formula for the limits of error of 5% and 10%.

The differences between these and the practical sizes are mainly due to the fact that for hand reduction several of the constants used in Reed's formula change with each repetition of the series of operations. There are also more repetitions than with machine reduction.

The three following methods of mixing are used in mine work:

1. *Pouring* from one pan into another. This imperfect method is used only in the final stages of reduction, and when it is to be followed by riffle cutting.

2. *Rolling* in canvas. This is the best method known, and is used whenever the sample is small enough to handle, say under 200 pounds.

3. *Coning.* The sample is shoveled into a conical pile so as to secure a uniform radial distribution.

The care used in mixing depends on the method of cutting which is to follow. Quartering requires very accurate mixing. It is not necessary for shovel or riffle cutting, but even here the work is improved with little trouble by roughly mixing before each cut.

(*To be Continued.*)

Reasonable Geology.

NUMBER III.

By FREDERICK DANVERS POWER, F. G. S.

By experiment, copper sulphide may be formed by fusion, in the wet way by precipitation, or by pressure. In the latter case Spring found that by subjecting a mixture of sulphur and copper filings to a pressure of 5000 atmospheres copper sulphide was formed. This, though an interesting fact, will hardly assist us in determining how chalcocite is formed in our mineral veins, as we cannot conceive the conditions in nature under which sulphur and finely comminuted copper could be brought to form the mass of mineral we find. If our experiments really follow out the natural condition, well and good; but it is by no means easy to imitate nature, or to carry out our experiments under exactly the same conditions as they are in her laboratory, where time and dilute solutions play such important parts. Many ingenious experiments have been performed, which have subsequently proved to be useless for demonstrating how certain results have been caused, because those who experimented did not sufficiently study the subject they wished to imitate.

The difference between theories promulgated by scientific and ignorant men is that the former base theirs on a wider range of well-digested facts, gained from all sources, and tested in various ways, whereas the latter are limited to the narrow circle of facts and ideas pregnant with false notions and prejudices with which they are familiar.

To form a correct judgment, one should possess reliable information and a thorough knowledge of one's subject, as well as an unprejudiced mind in considering it. Still, correct results are at times obtained, though false means are employed. The conclusions in such cases are not got on account of the false reasoning, but in spite of it; it is mere chance, and cannot be relied upon. The conclusions of those who observe and think in a superficial manner, and who are ready to jump at the first idea that presents itself as a solution to a question, are not to be trusted, notwithstanding that with the greatest assurance, devoid of the slightest misgiving, they tender their opinions. It never does to take anything for granted when it is possible to investigate it. Some people are so prejudiced against, or in favor of, certain theories that they put everything down to them, and refuse to inquire into anything opposed to their views. Alchemists in the olden days, seeking for information about the transmutation of metals, were satisfied with obtaining certain results without knowing the reason why. They observed when iron was placed in a solution of sulphate of copper that, after a time, the iron was converted into metallic copper. This was a favorite example of theirs to illustrate the possibility of one metal being changed into another. Unfortunately, they overlooked some vital points that greatly affected their reasoning, and which would have shown them that it was not a matter of one metal changing into another, as they understood it, but merely that there was an exchange of the condition of the metals, the copper replacing the iron in the metallic state, while the iron forming a sulphate passed into solution. People are apt to generalize on insufficient grounds, such, for instance, as the Plutonists, who put everything down to the action of fire, and their opponents who, equally bigoted, credited water with being the cause of all our rock formations. Forming conclusions when there are not sufficient data to warrant one in doing so has frequently caused expensive mistakes, such as the mining of baryta for cerussite, persisting in looking for a lost lode on the side of the greater angle only, etc.

Cause is sometimes confounded with effect. The presence of a fossil shell in a phosphate deposit may be taken by some as indicative that the phosphate had its origin in the mollusk, whereas in reality the phosphorus may have been concentrated in the shell from outside sources, long after the creature had been dead and buried.

Some evidence we have is as certain as such evidence can be, and still we are unable to prove it. Under these circumstances, we only accept it provisionally. It may be necessary to drive a point to an absurdity in order to prove or disprove it, and thus get one step nearer the truth. The boundary between two things is often so vague, they merging gradually one into the other, that it is difficult to see where one begins and the other ends. In such cases, much light may be gained by comparing the extremes, the difference being thus more obvious.

Many people are led astray in their conclusions by the apparent cause or origin of a phenomenon, which is really due to another entirely different one. How frequently do geologists have dendritic markings, found, perhaps, in some igneous rock, brought to them with the request that they will name the fern or moss, whichever it is its owner fancies it resembles. It requires but a slight knowledge of botany to discover that, though at first sight the manganese or iron oxide has apparently taken upon itself the form of a plant, yet, on closer inspection, the figure is not that of an organism, while further observation enables us to conclude, and experiment to verify, how such imitative forms are caused.

We cannot be too cautious in respect to negative results. It would never do to conclude that because the gravel of a river comes from the rocks of its watershed, if you are unable to discover fragments of some soft rock you seek among the pebbles, therefore this soft rock does not exist within that area. It is quite within the range of possibility, and highly probable, that the soft rock was unable to live among the harder debris, and became worn to sand or silt.

Sometimes it may seem as if one single accompaniment was sufficient cause for a particular result, but in reality there are others that are necessary. The presence of nuggets in alluvial deposits was originally put down to the disintegration of auriferous veins; and although some are no doubt due to this cause, yet there are many facts in connection with alluvial gold that this origin will not account for, such as the greater purity of alluvial gold over that found in the neighboring reefs; the presence of large masses of heavy gold, not at the bottom of the drift, as one would expect if rolled about in a stream, but within a few inches of the surface, as in the case of the great "Welcome Stranger" nugget, which weighed 2280 ounces. Careful experimenters and observers are inclined to favor the idea that the gold in such cases has been deposited out of solution.

The age of a rock cannot be told by its lithological characteristics alone; those of the same age may vary greatly, while those of different periods may be of similar composition and structure. The age of a conglomerate, it is true, may be limited, to a certain extent, by noting the rocks of which its pebbles are composed, if we know the age of these rocks; but then the absence of other rocks is only negative evidence, of which we must beware for reasons given above. Besides, we cannot determine the exact watershed of past days, not knowing the elevation of the land in ancient times, or the extent of disintegration that has taken place. To confirm our opinions as to the age, we need to follow out the sequence of rocks, and take the remains of the flora and fauna found into consideration.

It is often of interest to learn the order in which minerals have been deposited in veins. Take the case of a stanniferous granite vein. We have here reason to think that the more basic cassiterite first formed, then the mica, followed by the feldspar, and lastly by the quartz. The mica is more uniformly crystallized than either the feldspar or quartz, and frequently encloses grains of cassiterite. It also leaves the impression of its laminæ on the quartz, which seems to be the silica in excess of what is required to form the silicates accompanying it, and consequently fills up the interstices between the other minerals.

(To be Continued.)



OFFICE BUILDING OF GOLDEN GATE PARK COMMISSIONERS. *(See page 281.)*

Electric Power for Long Distance Transmission.

For periods of time ranging from two years down to a few months, not less than fifty power transmission plants have been working regularly in different parts of the world, ranging in magnitude from Niagara down to fifty horse power and in distance from the Folsom-Sacramento transmission, in the United States, having an extreme length of about twenty-five miles down to a mile or two. All these plants have been singularly free from trouble and have done their work well.

Admitting that distances up to twenty or twenty-five miles can be successfully overcome, is there a reasonable probability that the transmission of power can be extended over distances much greater? Yes, if necessary. We have no plants over twenty-five miles, but the methods and apparatus for longer transmissions have already been thoroughly tested, and up to at least fifty miles we are sure of our ground—perhaps up to a hundred miles. The transmitting and receiving machinery would be quite identical whether the line between them were twenty or fifty miles long, so that, as regards apparatus, the ground is well trodden.

For very long transmissions high electrical pressure is necessary to keep down the cost of the line, since the amount of copper required to meet given conditions decreases with the square of the voltage. And we have already experience with the voltage just as with the apparatus—at least with voltages ample for a fifty-mile transmission. For example, without counting the famous Lauffen-Frankfort experimental plant, with a line 108 miles long, and operated part of the time at a pressure of nearly 30,000 volts, there are now in commercial service four plants, running steadily and successfully at pressures of 10,000 volts and more. Chief among them is the Oerlikon installation in Switzerland, working at over 14,000 volts; then come Folsom-Sacramento, in the United States, and Guadalajara, in Mexico, at 11,000 each, and finally the San Antonio canyon plant, in the United States, at 10,000. The first and last mentioned have been in operation nearly three years without having encountered any appreciable difficulty from the very high pressure. The other two have been operated some months without a trace of trouble. From these experiences there is the best of reason to believe that voltages up to 14,000 or 15,000 are entirely justified by present practice.

Concerning distances of 100 miles or more, and pressures exceeding 15,000 volts, we have only the results at Lauffen by way of data. While these make no pretense of representing commercial practice, they still are good evidence that, as an engineering feat, a transmission of a hundred miles at 25,000 or 30,000 volts is quite practicable. While the feasibility of covering far greater distances at much greater voltage is more or less a matter of speculation, those who know most about the difficulties to be met fear them the least.—Dr. Louis Bell in Cassier's Magazine for November.

Recent Additions to Museum of California State Mining Bureau.

Native sulphur, Santa Paula, Ventura Co., Cal.

Rich copper ore, Inyo Co.; S. G. Gregg.

Several specimens of varieties of ulexite, Mesquite Valley, Inyo Co., Cal.; W. C. Chapin.

Curiously contorted slate, found in middle of quartz ledge, Sutter Creek, Amador Co., Cal.; Hon. E. C. Voorhies.

Auriferous barite (sulpbate of barium), Morning mine, Butte Co., Cal.; J. R. Scupham.

Fine crystallized azurite, Copper Queen mine, Arizona; Ben Williams.

Platinum (nugget), French mine, near Junction City, Trinity Co., Cal.; Mons. E. Saladin.

Gold in calcite, Bonanza mine, Minersville, Trinity Co., Cal.; Mrs. Tourtellotte.

Gold quartz, Three Sisters mine, Shasta Co.; Ellery Bros.

Five specimens gold quartz, Cripple Creek, Col.; E. Smith.

Eight specimens gold quartz and other ores, from Mono and Inyo counties.

Asphaltum—Remarkable porous variety, from the Patera mines, Santa Barbara Co., Cal.

Auriferous granite, from a ledge being successfully worked at West Point, Calaveras Co., Cal.; F. McMillan.

Two hundred and fifty-pound specimen of gold quartz, from the Madrone mine, Pioneer district, Volcano, Amador Co., Cal. Ledge is in granite. W. Q. Mason.

Very rich copper ore, chiefly erubecite, carrying thirty ounces silver and a little gold per ton, Cosumnes mine, El Dorado Co., Cal.; John Theisen.

And a number of other ores, rocks, etc.

Sent to the Bureau by Col. D. H. Jackson a remarkably fine specimen of variscite, from Belle Hill, Candelaria, Esmeralda Co., Nevada.

H. L. DURDEN, Secretary.

Mining Summary.

CALIFORNIA.

Amador.

IRON MASS. — *Ledger:* The owners of the Iron Mass mine, in Volcano district, sunk their shaft down 100 feet, and now are drifting. They have the drift in about forty feet. The ledge in the bottom of the shaft is 3½ feet wide and on the drift measures from 18 inches to 3 feet in width. They are progressing in the ledge taking out and storing the ore. They are using a double bucket horse whim. The ore they are taking out is even better than that crushed which went about $40 in free gold and 20 per cent sulphurets. The sulphurets have never been assayed but show gold in open fire tests.

Calaveras.

THE TULLOCH MINE.—At the Tulloch mine near Angels recently bonded by N. S. Wright, the shaft is down 150 feet, north and south drifts along the vein are being run. Thirty men are employed. The ten-stamp mill will be in operation in two weeks.

THE MACHU MILL. — The regular weekly cleanup of the Machu mine mill made Sunday yielded $703.40 for about sixty-four tons of ore. The north extension of the mine, owned by Mrs. Gray, has been bonded by the company.

THE GOLD HILL MINE.—Ten stamps are to be added to the mill at the Gold Hill mine, the ore body justifying the increase.

THE ECLIPSE.—Local authorities claim that the Eclipse Mining Co. claim that sinking the shaft on the flat was a mistake, and that the desired result would have been attained by following the lode down on the west side of the hill.

El Dorado.

THE POCAHONTAS.—The *Republican* says a few men are employed at the Pocahontas mine by D. W. C. Morgan, south of El Dorado, and are engaged in cleaning out some of the old works. The mine was famous for rich bodies of ore in early days and the surface has been thoroughly worked in all directions surrounding the shafts. Two interesting relics of ancient mining methods are to be found on the ground in the shape of an old arrastra and a Mexican mill. The latter comprises two large discs of stone six or seven feet in diameter and fifteen inches thick, each having a square hole in the center like a Chinese "cash," and mounted on a stone base around which they revolve in a circle when in operation. The three stones and the base on which they staud would have attracted much attention at the great fairs in Chicago or San Francisco. They look very much like two great cheeses on edge and resting on a larger one lying flat.

THE BLUE GOUGE.—The Blue Gouge mine, which John W. Mackay, James L. Flood, A. E. Hand and Superintendent Kervin of the Comstock went to see recently, is a low-grade proposition. It is a hig deposit of talcose slate, filled with small seams and veins of quartz, running in all directious and forming a sort of network. Such seam diggings in places are profitahly worked hy hydraulic process. The second hest mine in Siskiyou county is of this character. It is worked by How & Co., Chinese, who represent the See Yup, one of the six hig companies of San Francisco, and has been mined nearly thirty years. It is worked by hydraulic process, running day and night.

Inyo.

GENERAL NOTES.—J. Knupple, has shipped sixteen tons of silver and lead ore from his claim near Cerro Gordo.

F. Winkler has leased the Confidence mine, formerly known as the Sterling or Cuba mine.

It is reported that a fine body of ore has been struck hy the Darwin Development Co., near the Defiance mine.

O'Brien and Kennedy have leased the mines at Minnietta from J. J. Gunn.

Mariposa.

THE TYRO MILL.—*Miner:* The Tyro mill is running steadily and the ore from the new hody recently opened up on the 600 is more than meeting the expectations of the managers. The force of men has been increased during the past two weeks, and matters are now moving along their old-time familiar lines. Superintendent McLaughlin feels elated at the good showing being made and confidently looks forward to finding a higher grade ore on the 700 than is the case with the 600.

Plumas.

RICH GOLD MINE.—Salt Lake *Tribune:* F. B. Lathrop of Minneapolis, who has heen in this city for several days, last midnight left for Quincy, Plumas county, Cal., where he is operating a gold mine which is said to he one of the richest in the United States. With him went Thomas Weir, well known in the intermountain region as a successful mine manager, who goes out with Mr. Lathrop to examine the property.

Mr. Lathrop carries with him the remnant of the collection of gold quartz specimens from Plumas county which received the first prize at the World's Fair, the same collection afterward being awarded first prize at the Midwinter Fair. The collection is as fine a lot of gold quartz as was ever taken out of one mine, and exhibits not only the native gold, but crystallized specimens. One piece in particular attracts attention. It is a large piece of white quartz incrusted with gold, showing some hematite. On one corner of the specimen is a piece of hematite which oscillates with any movement made while holding the specimen. The secret of the oscillation is that the hematite is detached from the quartz, but is still held as a part of the specimen by a wire of gold.

The mine from which these samples were taken is on the Belle mountain, near Quincy, in Plumas county. Below the mountain is the famous Betsy gulch, from which $700,000 of placer gold was extracted from the grass roots in a few months. Mr. Lathrop had some of this placer gold with him, and some of the nuggets weighed over an ounce. These placers are supposed to have originated from the quartz ledge that has been opened up on the mountain, and it is to ascertain the extent and permanency of this ledge that Mr. Lathrop has engaged the services of Mr. Weir.

Nevada.

THE PROVIDENCE.—Rich developments have heen made at the Providence mine. The Providence quartz is usually filled with rich sulphurets, and it is rare that much free gold can he seen. There is an ahundance of ore in sight and the forty-stamp mill is kept running at its full capacity, night and day. They recently purchased a piece of land in the old Hirschman diggings, where they are having a large reservoir constructed, from which water will he taken to the mine to drive the mill and machinery. A large pipe line will be laid, and the flume that now conveys the water through the old hydraulic diggings will be abandoned. Four hundred feet of pipe twenty-two inches in diameter is to he used. The additional forty stamps that the company intend putting up will require the increased supply of water.

THE COAN MINE. — The Coan mine, two miles west of Nevada City, is a continuation of the contact vein on which the Champion and Providence are located. The mine is heing opened, hoisting and pumping plant erected and a 10-stamp mill is to he put up. M. Coan owns the mine and contemplates its sale to San Francisco men.

THE LIVE YANKEE.—At the old Live Yankee gravel claim, near Graniteville, a cooperative company have run a tunnel into the hill 600 feet to tap the channel, at an expense of $1500. A string of sluice boxes will be put in and the gravel now on the dump will he washed.

San Diego.

THE HIDDEN TREASURE.—Messrs. Frary & Johnson are running a level on the Hidden Treasure mine, Julian district. They had a erushing ahout three months ago which went $80 a ton and they are now getting out ore for another crushing. The level is now in 500 feet and 160 feet below the surface.

THE OWENS MINE.—T. H. B. Varney, the hicycle man, is opening up the Owens mine, at Julian, San Diego Co. The 350 shaft has 200 feet of water in it, which will be pumped out, the shaft retimhered and sunk deeper.

Shasta.

THE BRUNSWICK MINE.—H. Cochran, who with Mr. Rossi is operating the Brunswick mine near French Gulch, tells the *Press* that the Lane-Tozier syndicate, which honded the mine a short time ago, has thrown up the bond after running a tunuel 350 feet. Cochran and Rossi, who are working their claim higher up on the mountain, are getting out good ore and are not discouraged by reason of the honders failing to find the ledge. Cochran says that the ledge is irregular, extending down in shelves or steps, dipping first to the south and then to the north. From their tunnel, near the apex, they will sink a shaft a distance of 45 or 50 feet, then upraise from the tunnel that has heen ahandoned.

Sierra.

ACTIVITY AT SIERRA CITY.—Sierra City has had quite a boom in mining lately, says the Downieville *Messenger*. Last week there were several mines sold and honded, among them being the William Tell, Butte Saddle, Keystone, Roman and a mine owned by Mr. Quirolo. There has also been a big strike made on the Cleveland mine. The owners have been prospectiug this mine for five years and at last have heen rewarded hy striking a ledge in their lower tunnel, which is between thirty and forty feet wide and prospects well. Capitalists are beginning to he interested in this part of of the country—at least, the ice is hroken and we expect quite a boom. There are any amount of undeveloped ledges in this section awaiting development to make them good paying properties.

Siskiyou.

GENERAL MINING NOTES.—*Journal:* A syndicate of French capitalists is endeavoring to make a trade for the Bennett mines at Forks of Salmon and also the Red Hill mines on Salmon river. Bennett wants $150,000 cash down for his claim, which is one of the richest in the county, and the Red Hill claim is also very valuable mining property.

The work of developing and opening up the famous Steamhoat mine on McAdams creek still continues with very good prospects. This creek has always paid well, the gold taken out heing of course variety, easy to save in the sluices.

The Espey, Hunter & Co. mine at Hawkinsville continues to show up fine, with good prospect of a rich haul at first cleanup, to he made soon. The pumping machinery works smoothly in raising water to the hydraulic flume from Shasta river. to keep the giants busy 15 hours each day.

Songer & Dame having corked up an old drift, letting a great quantity of water into the old Pacific mine at Klamath river, are now taking out rich pay gravel again, and will continue doing so for over a month yet without further trouble, or possihly longer, if we are to have mild weather in December. Should the wiuter prove a dry one, the claim may be worked all winter, as heavy storms of long duration are required to raise the Klamath to any great extent.

The hydraulic miners at Oro Fino, Mugginsville and Quartz valley are making preparations for the winter season, to start work agaiu as soon as their ditches can he filled up with water to run the giants. The quartz miners in same sections are also getting out quartz and preparing for crushing.

The Horse Creek Mining Company have closed down for want of water. They had quite a large piece of ground stripped, hut could only clean up a small portion. The result, however, was very satisfactory, and the mine has been put in the best condition possible for extensive operations next season. The company owns 300 acres in all, 120 of which has been patented. A large frame boarding house, office building and blacksmith shop have just heen completed. The property will he in charge of Wm. Rohertson pending renewal of operations.

Trinity.

MINING SUPPLIES.—*Journal:* There were unloaded at the Redding depot last week a five-stamp quartz mill and battery and a large rock breaker consigned to the Altoona Quicksilver Mining Company at Cinnabar. The rock breaker alone weighed 5800 pounds without the fly wheel. A carload of sheet iron water pipe 8 inches in diameter and some hydraulic machinery, consigned to the La Grange hydraulic mining company, were also received. Wednesday a complete hoisting plant for a mine was unloaded there for W. C. Given of Junction City.

NEVADA.

ON THE COMSTOCK.—On the Brunswick vein the incline shaft of the Hale & Norcross company is down 160 feet in quartz and porphyry. The incline shaft of the Con. Cal. & Va. and the Best & Belcher companies is down 125 feet, with porphyry at the hottom. The hoisting works are ahout completed. Crosscuts will now be run to prospect the vein. The tunnel being run by the Savage has heen advanced a total distance of 400 feet, passing through porphyry, quartz and clay. Some new streaks of ore from two to four feet wide have been found in the Con. Cal. & Va. A four-foot streak on the 1750 level assays from $40 to $50 a ton. At the Ophir old works an exploration drift on the tunnel level, after passing some broken ground, has reached a formation consisting of solid quartz, assaying $2.50 per ton. The Hale & Norcross company is prospecting and making repairs. From some streaks that are being followed on the 975 level, twenty-eight cars gave an average of $73.58 a ton. The Savage extracted seventy carloads averaging $37.99. On the 950 level they have an upraise which has penetrated ore assaying $40 for a distance of five feet. While awaiting a milling-stage of water in the Carson river most of the mining companies are making repairs.

AN ELECTRIC PLANT FOR KENNEDY.—*Silver State:* O. W. Schweitzer, representing the New Era Gold Mining and Mill Company, has sent an order to San Francisco for the shipment of the electric milling plant, which is to he put up at Kennedy. The plant has heen thoroughly tested and found satisfactory. It will be shipped at once, and Mr. Schweitzer thinks the mill will be ready to start up by the first of December.

WHITE PINE COUNTY.

ELY DISTRICT.—Gold ore is reported struck in the Rob Roy south of the Chainman and Joana.

Parties doing assessment work on the Emma mine, in West Camp, found a hody of ore at the surface about five feet wide, assaying 60 per cent lead, 43 ounces silver and five dollars in gold, worth $65 a ton here.

ROBINSON DISTRICT.—Assessment work on the copper claims shows rich oxides on the Star, Star of the West, Monitor, Brooks and Pilot Knob. The lodes are large and wherever iron is found with the copper hear both gold and silver. Wherever sulphides of copper are found they also contain gold and silver. While the ores near the surface are chiefly the green and hlue ores and red and black oxides some sulphides are here and there found mixed with them.

LINCOLN COUNTY.

DE LAMAR WATER SYSTEM.—*Tribune:* The new water system being put in from Meadow is complete; over 100,000 gallons of water are heing delivered in De Lamar daily.

The new 120-ton cyanide addition to the mill will supersede the supply of the chlorination plant, the capacity of the mill will he doubled, and Capt. DeLamar is arranging for a capacity sufficient to treat $250,000 worth of ore each month.

The mine, according to reports, will not fail to supply the ore necessary for this increased milling capacity, as there is said to he a vein 100 feet thick of ore that runs $60 in gold per ton.

ARIZONA.

GENERAL NOTES.—*Oasis:* The Ripsey mine in Pinal county, closed down some months ago, has resumed operations, under lease to Otho Moses.

The Planet-Saturn Company in Yavapai county, is pushing work on its claims and taking out good ore. It is sacking up and shipping ore which will run $125 to $250 per ton.

The Cusenherry Co. have secured a promising gold and copper property east of Ehrenherg. Harrison, Curtis & Co., have secured three of the old copper and gold mines in Cuningham pass, north of the Cusenherry mines.

There are ten men at work on the Moscow gold mine, Agua Fria district. A test run of four tons of ore from this mine plated $48 per ton. Roberts' mill on the Agua Fria, is located just four miles away and owners of the mine are trying to lease the mill.

Nine men are at work on the Poland-Hamilton mine on Big Bug. A tunnel is heing run to tap the working of the Belle mine, which is owned by the same parties that own the Poland-Hamilton.

Work is heing pushed on the Last Chance mine, near Prescott. Eight men are now at work in the mine, where drifting is being pushed hoth ways from the bottom of the 175 foot shaft, workings heing in good milling ore.

THE UNITED GLOBE. — *Silver Belt:* The United Glohe mines increased their force this week and are now employing 45 men in their mines and in making surface improvements. The smelting plant will be almost entirely reconstructed and ore bins built. It will require at least six weeks to finish the improvements already begun and putting everything in shape for smelting. Harry Zschoeger has heen placed in charge of the mine work as foreman.

OREGON.

CURRY COUNTY.

KERBYVILLE. — Jacksonville *Times:* The business men of Kerby are now experiencing an old time mining boom and the little burg presents about the same life it did in the 50s. Hotels are crowded, pack trains are loading, and the stores are crowded with men going to the mines in the vicinity. A person cannot go toward any point of the compass and miss a mining camp. On Althouse, up the Illinois river, down that stream, west of Kerby on Josephine or Soldier creek, any direction one strikes mines and mines. It is thought that fully 1000 men are now in the vicinity, all actively engaged in mining or prospecting. Kerby is the distrihuting point for the whole region and is centrally located.

WASHINGTON.

REPORTED COPPER STRIKE.—A Springdale, Wash., special says excitement provails over a strike made by Jones Bros. of that place, in the copper district along Deer creek, of a 40-foot vein of copper pyrites which contains gold. There is said to he 2000 tons of shipping ore in sight. Many people are going in there and ground is being staked.

CAUSED A STAMPEDE.—Messrs. Wheeler and Maxwell who have been doing some work on the Iron King mine near Spectacle lake, Okanogan county, recently hroke through the iron capping when they reached ore which assayed $30 to $50 per ton. When this became known a regular stampede took place and within two days twenty claims were staked out.

IDAHO.

A PROFITABLE CONCERN. — The De Lamar Mining Company of Idaho paid a quarterly dividend of 1s per share at the office in London on the 30th ult., equal to $100,000, and making $400,000 for the year.

IN NEZ PERCE COUNTY.—The Big Bar Mining Co. of Salmon river hegan piping last week. This company was organized in Nebraska and commenced work last April. A six-mile ditch was huilt and water was taken from Divide creek on the Idaho county side of Salmon river and brought across the river at Rock creek. To accomplish this an inch and an eighth steel cable was used, anchored to an iron stayholt on one side and to a douhle windlass on the other, the pipe heing suspended from the cahle by clamps. The distance across the river is 1000 feet; the pipe was 250 feet ahove the river; 1800 feet of pipe was necessary to carry the water across the river. Owing to the unusually dry season, there was not sufficient water to mine with when the plant was completed, hut the late rains have startcd the water, and now the company expects to run day and night.

MONTANA.

ACTIVITY IN BUTTE.—*Miner:* During the past week there has heen considerable activity among that class of miners locally known as "leasers." Many of those who are working properties at a profit are adding to their possessions, while others are endeavoring to get into the money-making swim. The whole tendency seems to he to get hold of copper properties, silver heing a secondary consideration. There are very few idle miners in town, and those who are out of work are mostly recent arrivals.

LOWER CALIFORNIA.

PENINSULA MINING.—There is more activity among mining men in the northern district of Lower California, says the *Union*, than has existed since the days when the Aurora mine at Alamo was turning out anywhere from $20,000 to $50,000 per month in bullion for its owners. That was ahout five years ago. Four years ago Alamo hegan to give out, and until a few months ago was considered a comparatively dead camp, with little hope of resurrection. A few old pioneers remained hehind to putter around their claims, but the more active element said good-bye to the deserted shafts and shanties and sought greener fields. Those who stuck to the town had great faith in its ultimate outcome, and they believed that if once the dikes which were confronted in the Aurora, Princesa and other deep mines penetrated, greater wealth would he found heneath.

There is every reason now, apparently, to believe that Alamo and the adjacent country will rapidly come to the front again. Maj. Russell is reliahly reported to have made arrangements in London with the owners of the Princesa to join with him in carrying the shafts of the Princesa and Aurora down several hundred feet farthcr, and the Englishmen have put $50,000 in the pot for this purpose. The two properties adjoin on the lower slopes of Princesa hill, and it is likely that if any great strike is made in either, the other will share in the honanza. This theory was not substantiated, however, in the old days, for while the Aurora was sending up bucket after bucket of white ore bespattered with yellow gold, and the end seemed afar off, the Princesa, under hetter management and with more ample facilities for digging in the granite depths, made a very poor showing. At the end of the south tunnel at the 100-foot level in the Princesa the men could plainly hear the drills at work in the rich rock of the Aurora, through the solid granite, hut the Princesa people could not strike the yellow streak nor find anything at all promising.

The Viznaga mine at Alamo, under the management of Davis and Russell, is down 160 feet with enough good ore in sight to keep them husy for a year. A stamp-mill is running, and bullion will soon he shipped.

The Jacalitos district is experiencing a small hoom. Two mines have heen sold since Corrales parted with his claim for $15,000 some weeks ago, and the camp is getting quite a reputation. Parties are outfitting at Ensenada for the mountains in that locality and before spring some good discoveries are expected to be made.

Coast Industrial Notes.

—California has shipped 9,000,000 gallons of wine this year. It sold for $3,500,000.

—The working hours in the Sacramento railroad shops have been reduced from nine to eight per day.

—By a vote of five to one, Nevada City authorizes issuance of $60,000 bonds for a new water system.

—A. J. Uphaus of Everett, Wash., is shipping 1,000,000 cedar blocks to Indianapolis, Ind., to be used for street paving.

A saving of about 25 per cent in tie renewals has been effected upon the Southern Pacific by the chemical treatment of ties.

With potatoes at 30 cents per 100-pound sack on the dock here, it looks as though a San Francisco starch factory ought to be a paying industry.

Exports of wine from San Francisco during the first nine months of the year were 11,082,412 gallons, against 9,888,800 gallons during the same time last year.

The exports of lumber from San Francisco for the first nine months of the year were 11 751,000 feet, against 12,563,000 feet during the same period in 1894.

Imports of specie at San Francisco during the first nine months of the year were $2,691,000, against $2,331,000 during the same period in 1894. Of this year's receipts Mexico sent us $1,418,838, or over half.

—The track-laying force on the San Francisco & San Joaquin Valley railroad goes on at the rate of half a mile a day. The tracklayers will have their work done to the Stanislaus river, twenty-four miles, about December 15th.

—At Fresno five carloads of copper wire arrived last Tuesday for the new electric power plant now building on the San Joaquin river. Poles are arriving and the pipe is on the way. Fresno expects by April 1st, '96, to equal the recent Sacramento electrical display.

—General Manager Dodge and Traffic Manager Babcock of the Rio Grande Western are represented as saying that that company has decided to resume building operations next spring and the road will be built to Los Angeles on the line originally surveyed.

—The Colton cannery packed 964,000 cans of fruit this season. A total of 940 tons of fruit was bought at an average price of $18 per ton. For labor there was paid out by the company $21,000. The average number of hands employed during the working season was 375.

—The Virginia, Nev., *Enterprise* says the immense deposit of gypsum near the Mound house is to be worked. This material will be mined and transported to the mill at the stone quarry on the river, where it will be ground into a condition fit for use for stucco work.

—Foreign imports at San Francisco during the first nine months of 1895 were $28,763,450, against $30,694,000 during the same time in 1894. Of this year's imports we received $6,296,000 from Japan, $6,479,000 from the Hawaiian Islands, $3,921,000 from China and $2,954,000 from Great Britain.

—The Pacific Coast Land and Water Company has discovered a bed of fine glass sand in the Los Angeles river. Tests made with the sand have been successful. The glass product is said to be of brilliant color and transparency, and glass experts say that the sand found is superior to any discovered so far on the coast.

—The $10,000,000 to be provided by the syndicate organized to underwrite the Union Pacific Railway reorganization plan is to be used to pay off the past due coupons on the underlying liens and also the coupons on the same liens during the coming two years. By this action the right will be secured to foreclose the first mortgage.

—For the year ending June 30, '95, the San Francisco assessor gives the following summary of statistics of manufactures for the year ending June 30, 1895, as compared with the previous year:

Total value of manufactures, '93-94.....	$62,399,500
Total value of manufactures, '94-95.....	58,808,410
Number of persons employed, '93-94	27,073
Number of persons employed, '94-95.....	28,798

—Exports of specie from San Francisco during the first nine months of 1895 were $21,065,635, against $22,682,154 during the same time in 1894. Of this year's shipments $8,363,000 went to Hongkong, $3,417,000 to Shanghai and $8,096,000 to New York. There was $6,402,000 shipped in silver bullion, $6,197,000 in Mexican dollars, $7,109,700 in gold coin and $1,084,200 in bonds and currency.

—The Union Pacific Railway is credited with immediate intention to start a service in connection with the Northwestern and Oregon Railway & Navigation Company, by which the time between Portland and Chicago will be shortened twelve hours. The present time is eighty-four hours. A like reduction in time from San Francisco to Chicago is in contemplation in connection with the Central Pacific.

—Jas. Yerington is going to open up that Elko, Nevada, natural soap mine. For years the local residents have used this soap. It is the purpose of an Eastern company to refine it—add glycerine or some other ingredient. Mr. Yerington says he thinks he could guarantee an output of 100 tons per day, with the supply practically inexhaustible. The analysis shows: Sand 5.55 per cent, clay 62.97 per cent, alkalies 14.87 per cent.

—The greatest foreclosure sale ever made will take place the 10th of next month, when the Atchison, Topeka & Santa Fe Railroad Company, with liabilities reaching the prodigious amount of $367,000,000, will be quietly and quickly sold to the highest and douhtless the only bidder, representing the united security holders. Reorganization under the now thoroughly perfected plan will immediately follow, and the new Atchison, Topeka & Santa Fe *Railway* Company, with lessened debt and reduced rate of fixed charges, will start on its hopeful career. As to who will be the head of the new company, rumors are conflicting; the *Railway Age* thinks it is safe to predict that the owners will not consider it necessary to go outside of the present organization to find a president.

—Dr. William C. Day, special agent of the Census Bureau, says: "Asphalt is now found in fifteen States, but only California, Kentucky, Texas and Utah make any commercial use of the deposits. Most of this asphalt is found as bituminous sandstone and limestone, the Utah gilsonite, or gum asphalt, being the purest and most valuable, selling at $35 per ton. But this expense is partly accounted for by the fact that it must be hauled nearly 100 miles to the nearest railway."

The *Post-Intelligencer* has compiled statistics of Washington lumber and shingle shipments by rail, as follows, for the nine months ended September 30. They show:

	1895.	1894.
Shingles.....	1,595,000,000	1,365,770,000
Shingles (carloads)	12,101	8,115
Lumber (carloads).....	4,889	3,397
Lumber (feet)	73,230,000	52,962,000

The lumber carload shipments in 1893 were 4687, and in 1892, 5255. The shingle shipments by carloads were 4125 and 4564, respectively.

—Two large drainage districts have been organized in Sutter county; work on the drainage canals in Live Oak district is in progress. This canal will be twenty-two miles long and toward the lower end is twenty feet wide on the bottom. It is paid for by assessments on the lands that will be benefited and will cost about $30,000. The number of acres drained is about 18,000. A second district west of the first is known as Snake River district and will drain from 20,000 to 30,000 acres. No work will probably be done on the canal in this district until next summer.

—Two new revenue cutters are to be built here. One, to be called the Golden Gate, will be for harbor duty at San Francisco, in place of the Hartley, and the other, a single screw composite propeller, for general service. The dimensions of the larger vessel are: Length over all, 219 feet; length between perpendiculars, 200 feet; breadth of beam molded, 32 feet 6 inches; extreme, 33 feet 4 inches; depth of hold from top of flat keels on plate to the top of the main deck beams amidships, 17 feet 10¼ inches; displacement to mean draft of 14 feet above bottom of keel, 1280 tons. The Golden Gate's principal dimensions are: Length over all, exclusive of fenders, 110 feet; length between perpendiculars, 100 feet; breadth of beam, molded, 20 feet 6 inches; depth, molded at mid-length between perpendiculars, 12 feet ½ inch.

—According to a Victoria, B. C., dispatch, prospects for the British Pacific railway, projected to cross British Columbia and the Northwest Territory a couple of hundred miles north of the Canadian Pacific, have brightened considerably through the visit of a representative of British capitalists, who, it is announced, have entered into a contract which will result in actual construction being commenced early next year. This will be conditional on the province of British Columbia and the city of Victoria giving certain assistance in the shape of guarantee of interest on bonds or otherwise. This having been in contemplation for years, it is understood will be granted without hesitation. The representative now at Victoria is Lafayette H. DeFriese of Steele, DeFriese & Dickson, New York and London. He has been in conference with R. P. Rithet, principal promoter of the road, with whom DeFriese and other representatives of capital will shortly hold further conferences in San Francisco.

—Surveys are being made for the new coast railroad between San Francisco and Santa Cruz. It is a broad-guage proposition. Chief Engineer Holmes says it will shorten the time between the two cities to two hours. He says the work of construction will begin by Jan. 1, '96. The cost is estimated at $2,500,000. C. M. Sanger, a mining man of Milwaukee, Wis., is the president of the company which is composed of Eastern men. On the route there are perpendicular cliffs 400 feet high, half of which will have to be blasted into the ocean. There are many ravines which will have to be trestled. The maximum grade will not exceed eighty feet to the mile. This is between Amesport and Laguna. From the last-named point to Santa Cruz the maximum grade will be thirty feet. Heavy cuts and fills will have to be made along the road. There will be three tunnels at Point San Pedro and one at Ocean View, 3400 feet long and 120 feet under the track of the Southern Pacific road. The San Francisco terminus will be at Twenty-first street and Potrero avenue.

—The paper mill at Stockton, recently closed, has lost close on to $200,000, which the owners have more than made up by adopting a different plan of manufacture elsewhere. When the mill was first established at Stockton it was because there was an inexhaustible supply of straw for the manufacture of coarse and cheap papers, but rags and straw are not now eagerly sought as paper stock. The price of many kinds of paper has been reduced one-half or more since the mill was planned, consequent upon the general use of wood pulp, which had taken the lead of all other paper stock. There was not enough good timber for pulp anywhere about Stockton. So the paper mill company hunted for a new location, and found it a point in Oregon, near Salem, where timber of the right kind was abundant, and there was an unfailing water power. At that point the company began to manufacture wood pulp and to manufacture paper. They have supplied the greater part of the newspapers on this coast, and have for some time been making regular shipments to Australia, underselling in that market English paper. The result is that the same paper company that sank two or three hundred thousand dollars in the mill at Stockton has made enough money in the new concern to balance all the losses and to have a considerable margin besides. The whole thing strikingly illustrates the rapid change in trade and manufacturing conditions.

—The Commissioner of the General Land Office at Olympia, Wash., has rendered a decision involving the ownership of agricultural and timber lands in the Gray's Harbor country north of Aberdeen, Wash., valued at over $1,000,000. On June 5, 1895, the Northern Pacific selected the lands in question, but prior to that date they had been settled upon by twenty-eight bona fide settlers. On June 28, 1895, the Olympia officers were instructed to notify these settlers that they would be allowed thirty days in which to enter the lands covered by their respective claims. All of the twenty-eight applicants failed to make entries as allowed, and John F. Soule and others made application to file upon the lands, the rights of the others having been forfeited. The railroad company claimed, as it had selected the lands prior to the application of the second list of settlers, it was entitled to the lands in the event of original applicants losing their rights. The Commissioner holds that the rights of the first applicants did not expire until July, and that the railroad's selection was prior to that date and did not hold.

—This is how the Clear Lake proposition looks to the New York *Tribune:* Clear lake, seventy-five miles north of San Francisco, and 1317 feet above the sea level, having its outlet in Cache creek, a stream supplying 327,000,000 gallons of water daily, is to have its forces translated into electricity, sent on overhead copper wires, 20,000 horse power and upward, to the motors at San Francisco, besides doing lots of useful work all around the region and on the line of transit. On the way, the waste water is to irrigate hundreds of thousands of acres of land, making it bud and blossom like the rose. The water will be shot through Pelton wheels, which will be connected directly with the dynamos, the latter being among the largest and most powerful known. The transmission of the electricity under the waters of the bay has been an intricate and difficult problem, but has found its solution, and now presents no obstacles of a serious character. Compared with the potentiality of Niagara, which is equipped to send abroad 700,000 horse power over its electric channels, the forces generated by the descending floods of Clear lake are not very great, but are enough to help along the industries of San Francisco greatly, besides those subordinate and various utilities on the way. California is taking a front rank in electrical enterprises, and has enough power stored up in her mountain lakes and streams to make her one of the greatest manufacturing and industrial regions in the world, at the same time promoting her fertility in an immeasurable degree.

Books Received.

"Practical Application of Dynamo-Electric Machinery," by McFadden & Ray, 168 pp. 12 mo.; a compilation of primary information on types of dynamos, motors, storage batteries, heating, etc.; published by Laird & Lee, Chicago, $1.

"The Gold Mines of the Rand;" a description of the mining industry of the Witwatersrand, South African republic: F. H. Hatch and A. J. Chalmers, London, Macmillan & Co., N. Y., 308 pp.; price $6. Considerable appears in the MINING AND SCIENTIFIC PRESS and other mining journals every week regarding the general progress of the extensive gold-mining operations in that part of the world of which this book treats, but nothing of the technical research and extensive detail offered by this volume. The geology of the gold and coal mines of the Rand is given great prominence. The coal product of that region has been a result of the great gold output, and is of course overshadowed by its auriferous neighbor. In '94 the principal collieries supplying the Witwatersrand produced 501,422 tons of coal, of which 447,000 tons were used in the mines. Incidentally considerable prominence is given the "boom" features of that gold district, but that is only natural, and the chapters on ways and means of mining, styles of surface equipments, ore treatment, modes of living, wages paid, cost of supplies, etc., will be interesting to many California miners. In general, the whole practice there is based upon and modeled after California custom and experience, modified somewhat by local requirements. Deep levels and the future of that region receive considerable attention, prophecy being indulged in to the extent of predicating an ultimate annual output of $100,000,000 for an indefinite period. Typographically the book is a credit to the publishers, the section plates, maps and drawings adding to its utility as a medium of information regarding that very interesting region.

"Contractors' Methods Employed on the Great Chicago Drainage Canal," 72 pages, illustrated with 44 half-tone engravings, many of them occupying a full page and showing views taken along the drainage canal. These illustrations tell a story in themselves, which will be of much interest and practical value to contractors. Half of the book is devoted to a description of a traveling cableway used on the canal in the course of its construction. The description of this, as well as the other devices employed, is clear and concise, all facts and figures relative to capacities and cost being obtained from contractors and engineers in charge. The cableway is able to handle 600 cubic yards of rock in place per day. As a yard represents about two tons on the drainage canal, this shows a capacity of 1200 tons per day of ten hours, the material hoisted from the canal 35 feet deep and delivered on the spoil bank 700 feet distant. The result obtained by the use of cars in carrying material from an excavation and that of the cableway in handling the same material is given from actual work done on the canal. It is stated that laborers in sledging and filling carts averaged from six to seven cubic yards per man, per day, while in filling skips on the cableway the average was from twelve to seventeen cubic yards per man per day. The book also describes an inclined car system for handling material, and a steel and rubber belt conveyor for handling earth; also steam shovels and dredges of various kinds which were used principally on earth sections. The pamphlet on the Great Chicago Drainage Canal is published for gratuitous distribution, and copies may be obtained by addressing the Lidgerwood Manufacturing Company at New York, Chicago or Boston.

"Journal of the Association of Engineering Societies," Sept. Since the accession of the Technical Society of the Pacific Coast to the general association of such societies, the papers read at the Technical Society's monthly meetings, and the discussion thereon, receive some publicity in the journal of the association. The issue to hand contains a handsomely illustrated publication of a recent paper read before the society by John D. Isaacs on "Stopping a Troublesome Slide at Summit Tunnel," descriptive of a successful effort to overcome a difficulty of that nature near Wrights, on the Santa Cruz division of the S. P. road, by raising the beds of Los Gatos creek and its tributary, and constructing a concrete masonry retaining wall from two of the points pierced by the longer of the two tunnels at that point.

Personal.

LOUIS JANIN is this week visiting mines in New Mexico.

TAYLOR & WARD succeed to the assaying business of the late C. A. Luckhardt.

GEO. JOHNSTON, of the Risdon Iron Works, has returned from a visit to Butte, Montana.

A. H. CARLYLE has been appointed Provincial Mineralogist by the British Columbia Government.

DR. DRAKE, of Sonora, is negotiating some important Tuolumne Co. mining transfers this week.

WM. R. THOMAS, formerly of Grass Valley, is now superintendent Central Eureka mine, Amador county.

GEO. OBENAUER has gone to Victoria, B. C., to take charge of the branch works of the Giant Powder Co. there.

AFTER twenty-nine years continuous work, T. B. Covey retires from the superintendency of the Oregon Improvement Co.

H. W. CARR has succeeded Jones & Carr, Redding, Cal., and will continue the business of the Redding Machine Works.

CARL HESSE who has been appointed manager of a Westralian mine, leaves this week via New York for his new field of labor.

WILBUR LONG is now superintendent of the Star mine on the south fork of the Stanislaus. A new 10-stamp mill will be in operation there by Jan. 1st, '96.

O. S. CRESSLY has returned from Providence, R. I., and is taking an active interest in the development of valuable mining property in Tuolumne county.

JAS. HOATSON has resigned the superintendency of mines of the Butte and Boston. J. M. Merrill, the company's outside superintendent, has also resigned.

W. T ST. AUBURN, formerly of the Niagara mine, Shasta Co., is now superintending the operations of the Lo Magunda Development Co., at Salisbury, Rhodesia, South Africa.

G. W. PRESCOTT is succeeded as superintendent of the mechanical department of the Southern California railroad by C. F. Lane, formerly master mechanic of the Wabash road.

T. T. LANE'S resignation as superintendent of the Utica mine has not been accepted, arrangements having been made to allow him to devote some of his time to the Jenny Lind mine, in which he is considerably interested.

DR. W. E. EVERETTE, of Tacoma, who represented the Northwestern Mining Association at the annual convention of the Cal. Miners' Association in this city, has made a report to his association which elicits cordial response.

HORACE F. BROWN of Chicago, consulting and mining engineer, has gone to Cape Breton, Nova Scotia, to arrange for preliminary plans for a complete copper plant for the Eastern Development Company of Boston at their copper mines in Cape Breton.

J. J. KARMEEN has assumed the superintendency of the Dunderberg mine, Bridgeport, Mono Co. This mine has not been worked since 1872. Two-thirds of the stock is owned by the Mines Exploitation Syndicate, Ltd., of London. Mr. K. owns the remainder.

OTHER than California miners have found fame and fortune in South African gold fields. P. J. Triggs, a Montana miner, has made half a million in lucky investments; H. A. McMillan and M. Sullivan, of Anaconda, Montana, have responsible positions; V. M. Clements, formerly of Wardner, Idaho, is general manager of the Gold Fields Mining Co., and manages to exist on a salary of $30,000 a year.

H. W. WEST, a graduate of the California University, now manager of South African mining property for Cecil Rhodes, recently wired Thos. Price of this city for a competent man to take charge of some mining operations in Mashonaland. In response, J. H. Tibbitts sailed for New York this week. His annual salary is $8000. With him goes Malcolm McCallum, another Amador county miner and timberman.

Scientific Progress.

A Great Work Accomplished.

Last week saw the close of a task taken up by the U. S. Coast aud Geodetic Survey tweuty-four years ago, and steadily prosecuted to a successful terminatiou. It is the surveying of an arc line from Cape May in southeastern New Jersey on the Atlantic coast to Point Arena in this State on the Pacific, the greatest work of the kind in the world's history. The last work was done on the summit of Uncompahgre peak in southwestern Colorado, the highest mountain in the contineutal range of the Rocky mountains within the national boundaries.

The parallel describes an arc across the American continent, the westeru terminus at Point Arena on the Pacific coast, and the eastern at the lighthouse at Cape May, overlooking the Atlantic ocean. The line was run by the method of triangulation, the main theater of operations being between the crest of the Sierras and the eastern rim of the Rocky-Mountain range, from Mount Diablo to Pike's peak. On the latter peak the two divisions of the geodesians met early this summer, the one with the line from the risiug of the sun, across woodlands and prairie, and the other from the setting of the sun, across mountain, canyon and mesa. On Pipe's peak the Government's engineers compared notes and welded the two lines together, though the tying of the knot was really accomplished later on Uncompahgre. Strong and durable monuments have been built at points along the line in the West, and the mountain work, which is pronounced superior to anything of its kind, covered a wild and rugged scope of country 800 miles long, east and west, as a crow would fly. The line runs exactly one mile south of Treasury mountain, near Crested Butte, in Colorado, one mile south of Mount Como, in Nevada, and, as the imaginary line in school geographies will show, through Lake Tahoe. Jeff Davis mountain is just three-quarters of a mile south of the line.

The determining of the exact longitude and latitude of these and other mountains is to assist in the geographizing of the country, and is for perpetual effect. The only actual measuremeuts made were an occasional base line, one of them being in the Bonneville hasin, near Ogden, Utah. Aside from these the work was accomplished hy observations and trigonometrical calculations through the aid of the theodolite or altazimuth, mercurial barometer, chronograph and auxiliary pendulum, heliotrope and hygrometer.

The party comprised two divisions, the engineers or geodesians, and the preparatory party. The latter built the trails to the summits and erected the tents, brought up the supplies and kept open communication with the postoffice and railroad station. The camp built on Uncompahgre was a model one. A new trail was constructed from the hase of the peak and all equipments, with the exception of the theodolite, were packed up the mountain on mules' backs. The theodolite, in its case, weighing 200 pounds, was slung on two teut poles and carried five and a half miles up the steep trail hy relays of two men each. All the liviug tents, canvas and observatories were protected from the strong west wind hy walls of rock four feet high, and were also securely anchored to stroug posts set in piles of rock. The preparatory party looked after the transportation of the instruments and equipment from one station to another.

New statious have been made every summer since the work began on various high peaks in the Califoruia system of mountain ranges, in the Sierra Nevadas and the Rocky mountain system. The stations were each occupied by the geodesians for a greater or lesser time in each season until from each a due number of observations had been made. The geodesians moved eastward on either side of the imaginary line of the thirty-ninth parallel, tying it definitely to some peak or natural monument, and selecting the most eligible peaks for sighting.

The preparatory party preceded the geodesians from point to point, but on Pike's peak their services were not required, the cog-road furnishing means of ascent, and the fixed observatories on the top giving the necessary accommodatious and shelter. In the transfer from Pike's peak to Uucompahgre most of the paraphernalia, including stoves, cooking utensils and bedding, was sent to Lake City, in Hinsdale county, hy registered United States mail, and amounted to 3500 pounds in fifty packages, each with an 8-cent Columbian postage stamp thereon. It went through in the time of an ordinary registered letter. The preparatory's outfit included wagons, horses, and a pack-train of mules. One sedate old jack, starting out from Sacramento eighteen years ago, has been "hitting the high places" ever siuce, and this fall leaves the service of the Government hy heing sold at auction to the highest bidder.

Fuel had to be packed ou mules to the summit from timher line, and water was also carried up in casks in canvas slings.

Uncompahgre, where this thirty-ninth parallel of north latitude across the continent was finally determined, is a noted mountain among national surveys and Government expeditions, and has repeatedly been the station for geological surveys, heliograph signal experiments and exploring expeditious. Hayden's party occupied it during the field of investigation from 1873 to 1876. They placed its altitude at 14,235. Other estimates put it at 14,540, and an average of a large number has placed it at 14,510. The barometrical ohservations made this summer indicate its altitude to he considerahly more than the average of all those of the past. Uncompahgre is in high favor with the geodesians, because of its easy access, and the roomy summit, which is nearly five acres in extent, with a gentle incline. The humidity of the atmosphere in Colorado enabled them to live in the high altitudes with comparative comfort against life in similar elevations elsewhere. On the coast peaks the geodetes experienced a difference of 25° in dry and wet barometers. On Jeff Davis mountain the thermometer often stood helow zero. The thermometer recorded 19½° helow once when the geodetes were operating. It did so in clear blue sky, with the sun shining hrightly and to all appearances it was like a balmy May morning—there was no chill—but ere the geodete knew it the tip of his nose was frozen, his ears were frost-hitten and the only way he knew that it was a very cold day was by looking at the thermometer.

That which gave the geodetes the most personal concern was the lightning, but after experiencing several shocks they got comparatively used to it. In the last two years the lightning has been perceptibly more frequent than in former years. The pack mules showed an aversion to the element. As soon as they felt an electrical storm coming on they shook their heads and ears and left the summits.

The geodesians proper did not have the lonesome time that the heliotropers had. The former were half a dozen or more on some one peak, and able to he sociable, but the heliotropers were stationed in couples or singles at isolated peaks, and the daily routine was monotonous.

Chief Eimbeck has for nearly a quarter of a century lived above timber line, with an occasioual trip to Washingtou. When asked how life at extreme high altitudes affected a person he said he did not kuow, except that it was hard on a man. His hair was turned white, though he is yet in his prime, aud he has grown portly. He feels that he has been out of the world.

Life on the high peaks has been uneventful, devoid of thrilling iucidents, and often the greater portion of the nights were whiled away in making endless computations and calculations on paper by the light of paraffine candles.

There are some odd ends of work yet to he done, such as making a tie-to to the University Ohservatory and running another base line in Utah, and then the geodesians will seek other walks in life, having completed, without any noise or ado, a task of unusual scientific and world-wide interest.

Mechanical Progress.

Thirty Knots an Hour.

The armored cruisers Columbia and Minneapolis are capable of a speed of 23 knots an hour under favorable conditions. There are a very few smaller craft, uotahly torpedo-boat catchers, which can do hetter than this. The Havock, Hornet and Ferret have made several single mile runs at a speed of about 27 knots. The first named boat showed an average of 26.18 on her trial trip; the second 27.31 (with a spurt at 28.48), and the third 27.61, in six single-mile runs, the best of the lot heing at the rate of 28.346. The Sokol, a vessel just completed for the Russian Government has developed an average speed of 29.773 in six miles, and in three of them 30.102. This is the first official record of thirty knots anywhere in the world.

The Sokol differs but little from the other three boats just named in dimeusions and engine power. The Havock and Hornet are twins, with a length of 180 feet, and a tonnage of about 220. On her trial trip the Hornet carried 169 pounds of steam, and developed an indicated horse power of about 4000. Her engines made 388 revolutions a minute. The Ferret is 194 feet long and has a five-foot draught and the same tonnage as the other two crafts. Her mean steam pressure on her trial trip was 172 pounds, her engines made 363 revolutions and her indicated horse power averaged 4507. The Sokol is 190 feet long, and developed ahout 3700 horse power, with 160 pounds of steam and 405 revolutions, according to the United Service Gazette, London.

The Russian's hull is a little more finely moulded than those of the British torpedo-hoat destroyer, but the gain in speed is attributed not so much to the model or any other one cause as to a general improvement in many details of the propelling machinery. The hoat is huilt mainly of nickel-steel, although aluminum is employed, in order to save in weight where great strength is not especially required.

To M. Normand of Havre, France, belongs the credit of constructing the fastest boat that ever floated. Iu an official trial at Cherbourg last month the twin-screw torpedo hoat destroyer Forban, built hy M. Normand, attained an average speed of 31.029 knots.

Copper Strong as Steel.

The *Railroad Gazette* says announcement is made at frequent intervals of discoveries in the treatment of copper, usually in tempering it, and the discreet part of the world has long heen pretty shy of such claims. A Chicago man has, however, succeeded in obtaining results which appear to warrant further attentiou. He says that he has discovered a new process of treating copper, whereby castings are produced of a very superior quality and free from hlowholes. What is done to the copper to secure these results is not stated, but the effect of the treatment is to produce a metal that flows freely in casting and leaves very little trace in the crucihle. The castings are solid, smooth and free from blowholes, and show a fiue granular fracture when broken. The treated metal can be produced of different degrees of hardness, and is capable of being rolled into thin sheets or drawn into fine wire when cold without annealing.

The Illinois Central railroad shops have made some tests of this treated metal to determine its action while heing worked iu the machine shop. During the operation of planing, boring and turning it behaved much like steel, though slightly easier to cut.

During the past year the Worth Manufacturing Company, now of Benton Harbor, Mich., has been making the connecting rods of their gasoline engines of treated cast copper. They are used upon engines running at as high a speed as 600 revolutions per minute, and are not only cheaper than the old form of steel rod, but very satisfactory. No trouble has arisen from the treated copper hearings.

Tests made at the Washington navy yard show the treated copper to he pure, and, on a test bar 14 inches long and 1 inch on the faces, showed an elongation of 3¾ inches and an ultimate hreaking strength of 37,800 pounds. Other tests made in Chicago show the ultimate breaking strength to be hetween 36,000 and 38,000 pounds. The ultimate strength of ordinary cast copper is 24,781 pounds.

It is claimed that no alloy is used in the process of treating, and that the process is not expensive, and can he applied to a quantity of copper necessary to make the largest castings. The treated metal can be worked successfully with the planer, lathe, dies and rolls, or can be drawn into wire. The metal is considered by the makers superior to any other for hearings for heavy engines, locomotives and cars.

Acids in lubricating oils may he detected by putting the sample to he tested in clear glass hottles with a copper wire running down through the cork, air tight. Stand the bottles in a sunny place and leave for two or three weeks. If on removal verdigris or greeu rust is on the copper, there is an acid in the oil.

German papers assert that gas pipes made of paper are a success. Manila paper strips are passed through molten asphaltum and then moulded under heavy pressure. After cooling, the pipes, which may be of any desired length, receive a water-proof coatiug.

Electrical Progress.

The Electric Wheel.

If multitudinous patents and numerous improvements go for anything, the road electric cycling machine will soon be au accomplished fact. Oue electric tricycle, "built for durability, comfort and every-day business and pleasure use," weighs complete, without motor or batteries, 47 pounds; with motor and batteries, 160 pounds. The machine is designed for a maximum load of 500 pounds, riders and baggage. The battery case and motor are spring mounted, and the seat is of leather, hammock style. Another electric tricycle is peculiar in having the forward wheel as the driving wheel. The current is obtained from two cabinets of battery, each 24x8x8 inches, which are fixed on either side of the driving wheel. Their weight is 100 pounds. The carriage part of the vehicle is a light structure consisting of a simple framework, with a wide comfortable seat and two pneumatic tired wheels hung in ball bearings. Each wheel is independently journaled, so that all extra frictiou on curves is avoided. The peculiar feature of this tricycle is that the front wheel, being the driving wheel, and carrving within itself the entire locomotive force, is practically a mechanical horse. It can be detached from one vehicle and hitched on to another in one minute, and will work as well in front of a sleigh as when drawing a carriage. It is claimed that one filling of the cells will ruu the vehicle from 100 to 150 miles, according to the coudition of the roads and the load carried. Enough of the concentrated hattery solution may be carried for a 500-mile run. In England, a tricycle propelled by a tiny petroleum motor is beiug used. Its weight is under ninety pounds. The petroleum vapor is ignited by an electric spark. In order to set the machine in motion, the rider admits the petroleum hy turning a tap, which at the same time

turns on the electric current. In mounting a hill the rider can assist the speed by gearing up the pedals and using the feet, thus adding animal power to that of the motor. The latest form of electric bicycle is now running in the streets of New York. It weighs, with its electrical equipment, sixty-four pounds, and carrying fifteen pounds for twenty-four hours at the rate of thirty miles an hour. The power is derived from a storage battery placed under the saddle which is connected with a small motor geared to the rear wheel. The current is controlled by push buttons near the handle bars. A powerful electric lamp and an electric buzzer to warn pedestrians complete the equipment.

The Inverted Arc Lamp.

The electric arc lamp has already been open to the objection that it casts dark shadows. Its illumination is not diffused enough for many of the purposes for which light is needed indoors. The experiment has been tried in several factories on both sides of the Atlantic during the last year or two of throwing the rays upward first, and reflecting them from a clean white ceiling. The results thereby attained satisfy those who made the tests that the new plan is a distinct improvement upon the old one for certain establishment, and a special inverted arc is being manufactured for the trade. The reflector surrounding the arc opens upward instead of downward, and the mechanism for feeding the carbon pencil as it consumes is arranged below instead of above the arc. The direction of the current is reversed, too, so as to make the lower carbon the positive pole. Even without a reflector over it, the ordinary arc lamp throws more light downward than upward, because the extremity of the upper carbon at the gap is more luminous than that of the lower one. But by causing the current to flow in the opposite direction the lower tip is made to glow more intensely, and hence the proportion of the total radiance thrown upward.

Electricity to Displace Steam.

A dispatch from Chicago says: Within the next year the Illinois Central and the Chicago and Northern Railroads, both of which are now operated by steam, will be run by electricity. It is possible that the latter road will use electricity on its entire system, while the Illinois Central will begin with its suburban service only. Already the official call for a special meeting of the Illinois Central stockholders to ratify this decision has gone forth. That meeting will be held in this city on November 26th. At that time the stockholders will be asked to increase the capital stock of the company from $50,000,000 to $60,000,000, one-half of this increase to be spent in and around Chicago, the other half to be used in the extension of the Southern system. Bids have already been secured from builders of electrical appliances for the complete equipment of the system. It is estimated that the entire cost will be from $3,000,000 to $4,000,000. This will include the substitution of electricity for steam as the motive power in the company's car shops at Burnside.

NEW apparatus designed to bleach cotton cloth by means of electricity is briefly described in late foreign periodicals. Two horizontal rollers, one made of iron and the other of carbon, are employed in such a way as to serve as electrodes, being properly connected with a battery or dynamo, and the two lying very close to each other. The cotton cloth, before passing between them, is soaked in salt water. The electric current, passing from the one roller to the other, disintegrates the salt, and the chlorine accumulates in the goods. The other element, freed by electrolysis, sodium combines with the water instantly to produce caustic soda, which is taken up by an endless felt blanket running over the iron roller and out through a water tank. After becoming impregnated with chlorine the cloth is rolled up and allowed to stand long enough to allow the bleaching agent to complete its work. It is intended to equip the machine with several sets of such rollers as are here described.

A Talk Meter Wanted.

The man who wishes to take a short cut to fame and fortune has now the chance of his life before him. The crying need in the telephone business is a talk meter, an automatic arrangement by which language can be measured off and recorded in specific lengths. The telephone exchange people say that the garrulity of some of their subscribers is appalling, and that the trouble is not confined to one sex. The sound of their voices in the telephone transmitter has for some people a great fascination, and they will be ringing up "Central" all day if they can find the most trival pretext. The telephone companies say that in this way a large amount of work is unduly thrown on the exchange employes. They hold that the fault is with the system, and that if people could be made to pay according to the number and length of calls, they would make more temperate and legitimate use of the instrument. Philadelphia is approaching the idea. The Bell Telephone Company there gives what is called measured service, the "measurement" being determined by the number of calls or connections, each five minutes' conversation or fraction thereof being counted a call. This gives subscribers rates in proportion to the use of their instruments. Some such method as this will have to come into general use if the abuse of the telephone is to be arrested. Seven hundred and fifty million telephone messages were sent over the wires last year, averaging about ten messages to every man, woman and child in the United States. Telegrams never exceeded one per head per year.

IF a fine alumiuum wire is traversed by an electric current sufficiently intense to heat it beyond its point of fusion, it may be heated to a dazzling white heat and remain in this condition. This is quite contrary to what happens with other metals subjected to the same test, which, when their point of fusion is reached, break suddenly, each broken end presenting the form of a little metallic globule, produced by the contraction due to the superficial tension of the liquefied metal.

ELECTRIC current for lighting and power is to be transmitted to Seattle from a distance, if plans on foot are carried out. Two dams to raise the levels of natural lakes are projected, together with a pipe line from one of these to a power house, "from which an eleven-mile wire would run to Seattle."

THE Nevada City *Transcript* says the Electric Power Company has now received all the machinery it will require for generating 1000 horse power. Preparations have been made for increasing the plant to 3000 horse power whenever the business will justify it.

Practical Information.

Overathleticism.

The body can be killed through one organ, and in youth and middle age mortal injury of body and mind comes usually through one organ as the primary seat of evil. It is an evil of frequent occurrence and greatly on the increase. A man is said to "throw himself, heart and soul, into his work." Such a man is in danger. He has four great parts of his body to consider—his heart and blood system, his lungs and other organs associated with breathing, his muscles, his brain and nervous system. But he does not head them at all. He runs or cycles excessively, and in a much shorter time than he has the least idea of he makes his heart too strong for the rest of his organism and endangers the finer ramifications of the vessels which are under the domination of the heart. He rows without studying consequences, and long before he is convinced of trouble he has produced an injury of the chest mechanism which may soon be permanently established.

He takes to some muscular training, which puts the muscular organs to an extreme of tension. Large and small muscles alike are exposed to strain, both the strong muscles that give propulsion and the delicate muscles that guide, and before he has become conscious of the error he has committed he is a strained man, from which predicament he is fortunate if he make anything like a complete recovery. Another man enters into competitions in which his mental organs are kept awake for long intervals, charged with expectations, anxieties, fears, nay, excess of satisfaction, and while he is yet young he grows old.

Wages Paid at the Chicago Drainage Canal.

The biggest work now going on in the United States is the construction of the immense canal from Chicago on Lake Michigan to the Illinois river; over 8000 men are employed. All but a comparatively small number are paid by the day, the average wages running as follows:

	Per Day.
Laborers	$1 50
Teamsters	1 50
Drillers	1 75
Train men	1 75
Channelers	2 50
Blacksmiths	2 50
Machinists	2 00
Carpenters	2 00
Stone masons	3 50
Firemen	1 75
First levermen	2 50
Second levermen	1 50
First hookers	1 75
Second hookers	1 50
Riggers	2 25
Cableway repairers	2 25
Boilermakers	3 50

The salaries of the men employed by the month are as follows:

	Per Month.
Superintendents	$100 to $150
Timekeepers	50 to 75
Bookkeepers	60 to 125
Foremen	60 to 80
Pumpmen	50 to 80
Electricians	75 to 90
Civil engineers	90 to 100
Steam shovel engineers	125
Steam shovel cranemen	90 to 100

During the summer months of 1895, about 8700 men were employed, of which 1700 or 19½ per cent earned $2 per day or more; and 7000 or 80½ per cent earned from $1.50 to $1.75 per ten hours; for shifts longer than ten hours, the men are usually paid pro rata for the extra time. Board is $4.50 per week.

Future Inland Waterways.

It would not be a wild prediction to say that persons now living may read of a vessel leaving Liverpool, passing through New York harbor, up the Hudson river, through a canal to Lake Erie, thence by Lake Michigan to Chicago, down the Chicago canal into the Mississippi, thence up the Mississippi into the Missouri, up that and thence by canal to the Columbia river and down that into the Pacific ocean, and thence back by way of the Suez canal, thus circumnavigating the globe and crossing the North American continent. The distance between the headwaters of the Missouri river and the Columbia is about 400 miles, and it is said that a canal connecting them is practical. It is not likely that such a sailing feat may ever be witnessed, but it is possible. It is not likely that the Columbia and Missouri will ever be linked, but there is nothing visionary in the linking of the lakes, nor in connecting them with such rivers as the Hudson, Ohio and Mississippi.

Comparative Value of Foods.

Prof. Atwater's exhaustive studies and experiments in this line have led him to the conclusion that the greatest nutritive value in any kind of food of the same specific cost is to be found in cornmeal. He finds that in 10 pounds of the latter there are slightly over 8 pounds of actual nutriment; in 8¾ pounds of wheat flour there are over 6¾ pounds of nutriment; in 5 pounds of white sugar there are 4½ pounds of nutriment; in 5 pounds of beans there are 4 pounds of nutriment; in 20 pounds of potatoes there are 3¾ pounds of nutriment; in 25 cents' worth of fat salt pork there are 3½ pounds of nutriment; in the same value of wheat bread there are 2¼ pounds; in the neck of beef, 1¾ pounds; in skimmed-milk cheese, the same as the latter; in whole-milk cheese, a trifle more than 1½ pound; in butter, 1½ pound; in smoked ham and leg of mutton, about the same; in eggs at 25 cents a dozen, about 7 ounces; and in oysters at 35 cents a quart, about 3 ounces.

A MEXICAN lumber dealer, interviewed by the *Timberman* on the subject of Mexican logging and lumbering, says all the logging is done by hand. Indian labor is employed very largely, although considerable Mexican help is required. He says it is rather an interesting sight to see a dozen or more Indians roll the logs a distance of half a mile to the mills. He states that Indian or Mexican labor, or peon labor, is similar to the old slave labor in the Southern States. If a man runs away after you hire him the law brings him back. The men are paid an equivalent to 18 cents a day in American money. Some of them are hired by the month, at $6 per month and found. The word "found" means to supply the laborers with a bushel of corn and a peck of beans each per month, in addition to the $6. The principal manufactures there are of cottonwood, Spanish cedar, mahogany and musket.

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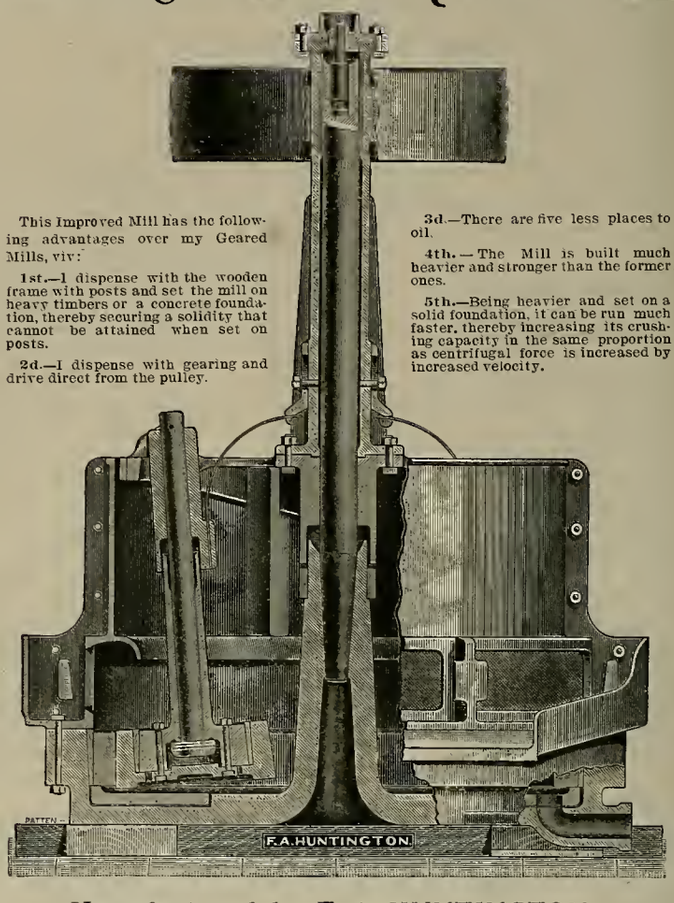
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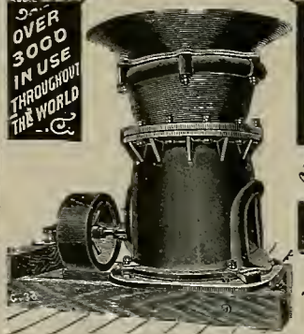
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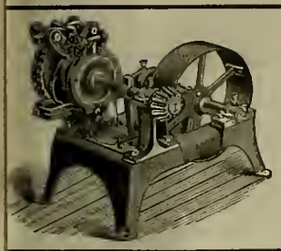
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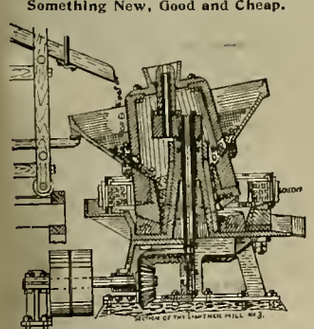
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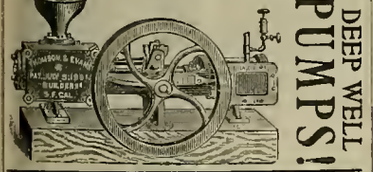
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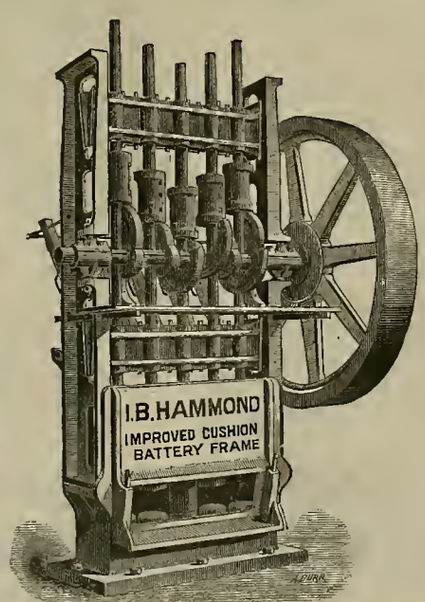
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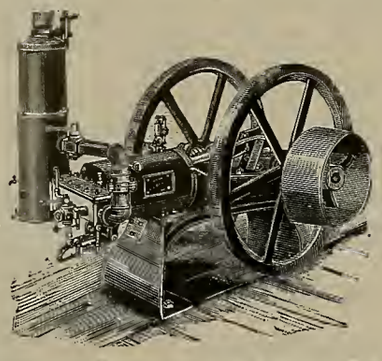
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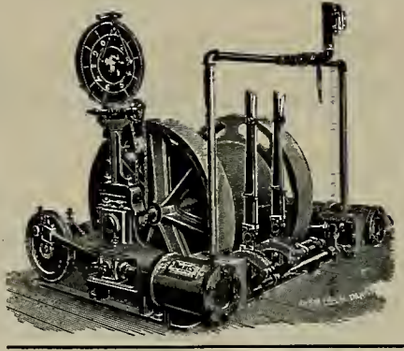
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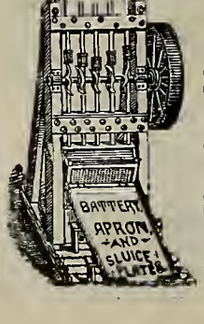
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—DEALER IN—

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ADAMANTINE SHOES AND DIES

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CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.





These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

Manufactured by CHROME STEEL WORKS, Brooklyn, N. Y.

H. D. MORRIS & CO., Agents, 141 and 143 First Street, San Francisco.

Special attention given to the purchase of Mine and Mill Supplies.



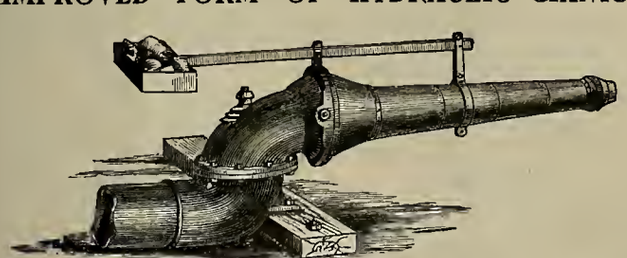
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H. D. MORRIS & CO., DEALERS IN MINING MACHINERY AND SUPPLIES.

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MANHATTAN RUBBER BELTING, PACKING AND HOSE,
SANDERSON DRILL STEEL,
MORRIS CENTRIFUGAL PUMPS,
LIGHT STEEL RAIL.

IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 42 Fremont St., San Francisco.

A REVOLUTION IN ORE PULVERIZING.

THE

Merralls Hydraulic Quartz Mill,

The Greatest Ore and Rock Pulverizer in the World, Either Wet or Dry.

THE ONLY MILL BUILT THAT RIVALS STAMPS. Our six-foot mill (No. 1) will reduce more ore or rock to pulp than a ten-stamp mill, with less than one-half the power and less than one-half the wear and tear, besides saving a much larger per cent of the gold in the ore.

This mill will reduce from 25 to 500 per cent more ore than any other rotary mill in use. Cheap, simple and economical. Four sizes built—from 15 to 250 tons capacity.

Send for Circular. Address

MERRALLS MILL COMPANY,

45 & 47 Fremont Street ..... San Francisco, Cal.

Market Reports.

The Markets.

SAN FRANCISCO, Oct. 31. 1895.

The general belief in better times has been discounted in some quarters, to the effect that buyers think they may do better by waiting. This applies mostly to the iron and steel business. The rest of the metals show continuous life and on all sides great activity is reported. Silver's see-saw puts it at about the same relative figures as the previous week.

Contracts covering the output of bar silver for some months in the future extend from China and Japan, by way of London, New York and Denver, the principal American producers of silver ore. The steadiness of the silver quotations indicates the existence of far-reaching contracts and of an endless chain which unites the nations of the East with the mines of the West.

London, as the financial center of the world, is the head. The corner, by the way, was many times proposed between 1887 and 1893, but never carried out. The projectors were willing and urgent, but the rapid increase in supply, together with the fear of adverse legislation, kept the moneyed men out. Now the conditions are different. The falling off in the world's silver product this year is noticeable. In 1892 the highest figure of the United States' production was reached, 63,500,000 ounces.

Add to the decline in production the small stocks of bar silver in London and New York and the steady shipments from San Francisco to China and Japan, and it would seem that the conditions are favorable for a steady advance. This advance will not mean a great deal to a number of the larger mines while present contracts with the smelters hold good, but it will have the effect of raising prices when new contracts are proposed and of opening up a large number of properties that are at present idle.

Harrison's coal circular says: During the week there were eight arrivals from the coast collieries with 18,119 tons, and 7323 tons from foreign sources. There is nothing special to note during the week, business in this line being particularly quiet. The prospects of early rains are inducing some housekeepers to see that their fuel bins are being replenished, although it is generally believed that there will be no advance of values during the winter months. The market is well supplied with all grades for steam and domestic uses—in fact, the want of yard room caused some recent arrivals of foreign coals to be disposed of at a material loss to the importer. Recent cabled advices report a very strong freight market for coal carriers from England to Australia. Cumberland coal bas been advanced $2.50 per ton this week. Harmouy again prevails among the Baltimore shippers.

New York Metal Market.

NEW YORK, Oct. 31.—PIG IRON—Southern, 12@14.50; Northern, 12@14.00.

COPPER — Brokers', 11¾c; exchange, 11.80c.

LEAD—Brokers', $3.15; exchange, $3.30.

TIN—Straits, 14.60@14.75c.

SPELTER—Domestic, $4.00.

New York Silver Prices.

NEW YORK, Oct. 31.—Followiug are the closing prices for the week:

	Silver in— London.	N. Y.	Copper.	Lead.
Friday	31	67⅝	11 80	.....
Saturday	30¾	67⅜	11 75	3 15
Monday	31	67¾	.....	3 15
Tuesday	31⅛	67⅞	.....	.....
Wednesday	31⅛	68	12 00	3 15
Thursday	30⅞	67⅞	.....	.....

The local hullion, money and exchange quotatious current are as follows:

Commercial Loans, ¾ per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.87½
London Merchants	$4.86
London Sight Bankers	$4.88¾
Refined Silver, per ounce	68c
Mexican Dollars, nominal	55c

San Francisco Metal Market.

COPPER.

Bolt	¼ & 5-16, 20c; ¾ and larger,		21c
Lake Superior Sheathing	22	@	—
Ingot, jobbing	—	@	18
Ingot, wholesale	17	@	16
Sheet copper	—	@	21

ZINC.

Sheet	9½	@	

LEAD.

Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "	"		1 45
Buck, Balls and Chilled, do, "	"		1 45

IRON.

American Soft	16 00	@	18 00
Pig, per ton	18 00	@	20 00

STEEL.

English, lb	16	@	19

ANTIMONY.

Per lb	—	@	10½

PIG TIN.

Per lb	15	@	16 00

QUICKSILVER.

Home trade, per flask	39 00	@	40 —

BORAX.

Refined, in car lots	—	@	5½
Refined, in sacks and barrels	—	@	5¾
Powdered, in car lots	—	@	5¾
Concentrated, "	—	@	4¾

TIN PLATE.

Per bx	5 25	@	6 00

ZINC.

Sheet	8½	@	

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00
Greta	7 50
Nanaimo	7 00
Gilman	6 50
Seattle	6 00
Coos Bay	5 00
Cannel	8 50
Egg, hard	12 50
Wallsend	7 50
Scotch Splint	7 50
Brymbo	7 50

TO ARRIVE—CARGO LOTS.

Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

NAILS.

Wire	$3 50
Cut	3 25

LUMBER.

SAN FRANCISCO — WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, October 31, 1895.

The market has continued to hang around; a few cents up and a few cents down. This has been its characterizing feature for over eight weeks, which makes it hard for an outside person to turn an houest penny so as to bring in a profit at another's expense. Why the market has been and is still kept in this condition it is difficult to say. There are various theories regarding it, one of which is that the manipulators are trying to get in all the shares possible, so as to make a small deal; another is that they are not prepared to commence an active campaigu until further work is done in the mines, so they can tell where they are; and still another is that they are keeping the market down so as to let the different compauies use up the money on hand and then levy assessments. Tbeories are more or less correct, but experience has taught that in the end they prove to be false beacons when using them as a guide in the share market. This, no doubt, is due to the fact that the manipulation of mining shares is a busiuess peculiar to itself, and cannot be gauged by that of any other. While saying this it cannot be denied that movements, so far, are in line with those which preceded former deals; but whether the same results will follow now it is hard to say. It is an open secret that such men as Col. Alvinza Hayward and John W. Mackay will uot back any move calculated to promote high prices unless the mines show one or more large-sized ore deposits, on which an upward move can he maintained successfully; but there are others always ready to attempt such a feat. It is maintained by many in position to know that in making the upward move of a few months ago those who manipulated the market had more shares thrown at them tban they cared to haudle at the higher figures. Since then they have taken in a large line of shares at lower figures, and are preparing for another bull move. Whether they will succeed this time in unloading at a good profit remains to be seen. It is not at all probable that many dealers will be badly hurt, financially, in trying to get even or make a profit.

The news from the Comstock mines contiuues confirmatory of active developing and exploiting work being done. In the Alta group it is of quite an encouraging character, which causes many of the more experienced miners to look with favor in that direction.

In the Gold Hill group the developing work is further advanced than in any other group. The ore lately found in Confidence is being run for in several of the mines at that end, including Seg. Belcher, Belcher, Crown Point, Kentuck, Yellow Jacket, Con. Imperial and Alpha.

In two of the above the west lode is liable to be struck at any time after next week unless it dips more to the west than had been expected. In the middle group the work grows in iuterest, although, as yet, there is nothing in sight to warrant dealers in shares to operate for anything beyond a slight turn on reports of improvements. These improvements are liable to be only for a day and again give out. So far as official letters go—and they are the only advices which deserve attention—they are following stringers and veins with the hope of one or more leading up to a big ore deposit. In doing this some ore is extracted, which helps to pay expenses.

In Gould & Curry and Best & Belcher the work is essentially unchanged from that reported last week.

The Con. Virginia management is pushing work with considerable vigor so as to determine if a large deposit of ore can be found.

In Ophir and Mexican the work to the west is about the same as given last week. It points to time before results can be determined. The same remarks apply to Union and Sierra Nevada. In Andes favorable work is under way.

From the outside mines no news of importance is allowed to leak out. It is claimed that quite important work is being done in the Bodie district; still it may take time to see if it will develop favorably.

Work on the Brunswick lode ought to attract more attention soon. Cross drifts (called on the Comstock crosscuts) have been commenced under favorable circumstances. It is thought that some time in the future good results will follow the work.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Alpha Con, Nev	15	10c	Sept 30, Nov 5, Nov 28	C E Elliott, 79 Nevada Block
Alta S M Co, Nev	50	10c	Sept 16, Oct 21, Nov 11	J E Jacobus, 308 Montgomery
Bulwer Con M Co, Cal	11	5c	Oct 29, Dec 4, Dec 31	C E Elliot, 309 Montgomery
Exchequer M Co, Nev	38	5c	Oct 21, Nov 25, Dec 19	C E Elliot, 309 Montgomery
Gray Eagle M Co, Cal	41	5c	Sept 23, Oct 28, Nov 23	W J Gurnett, 308 Pine
Iowa Mining Co, Nev	21	5c	Oct 23, Nov 26, Dec 16	R L Thomas, 419 California
Nevada Queen M Co, Nev	9	5c	Sept 13, Oct 16, Nov 12	Wm. Bowers, 331 Pine
Occidental Con M Co, Nev	20	10c	Oct 1, Nov 14, Nov 25	Alfred K Durbrow, 69 Nevada Block
Seg Belcher, Nev	16	10c	Sept 12, Oct 15, Nov 4	E B Holmes, 309 Montgomery
Savage Mining Co, Nev	87	20c	Sept 20, Oct 23, Nov 12	E B Holmes, 309 Montgomery

The following illustrates the changes of the week:

Mines.	Oct. 24	Oct. 31
Alpha	.....	$ 23
Alta Consolidated	.....	.....
Andes	$ 36	32
Belcher	47	46
Best & Belcher	90	80
Bodie	35	27
Bullion	.....	10
Challenge	60	53
Chollar	48	.....
Confidence	1 65	1 45
Consolidated California and Virginia	2 80	2 60
Consolidated New York	.....	.....
Crown Point	39	.....
Exchequer	.....	05
Gould & Curry	.....	38
Hale & Norcross	1 50	1 45
Justice	.....	.....
Mexican	67	58
Ophir	1 60	1 35
Overman	.....	12
Potosi	62	59
Savage	53	52
Sierra Nevada	96	90
Union	73	65
Utah	10	.....
Yellow Jacket	38	34

San Francisco Stock Board Sales.

SAN FRANCISCO, Oct. 31, 1895.

9:30 A. M. SESSION.

100 Alpha	23	200 Hale & Norcross	1 45
300 Belcher	46	150 S Belcher	13
500 Best & Belcher	80	150 Sierra Nevada	90
30 Bullion	10	150	89
50 C. C. & Va	2 60	50 Yellow Jacket	34
800 Exchequer	05		

SECOND SESSION—2:30 P. M.

200 Ophir	1 35	50	1 45
100 Mexican	58	350 Sierra Nevada	85
200 Gould & Curry	38	1000 Exchequer	05
300 Best & Belcher	75	1200 Overman	12
100 Savage	52	600 Union	65
500 Potosi	59	200 Challenge	53
100 Hale & Norcross	1 35	500	52
100 Yellow Jacket	33	500 Scorpion	04
1000 Con. Imperial	03	300 Bodie	27
200 Confidence	1 40	300 Andes	32

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Niedecker & Alderson, in the Bobby Burns Mine, near Placerville, El Dorado Co., to impound tailings in a ravine below the mine; from Martin Bros., in the Martin Mine, near Placerville, El Dorado Co., to impound tailings in a ravine below the mine; from Eugene Piaggi, in the Blacklock Mine, near Placerville, El Dorado Co., to impound tailings in a dry ravine; from H E. Picket, in the Tiedman Mine, near Georgetown, El Dorado Co., to impound tailings in Marshall Canyon; from Geo. W. Davey, in the Sailor Flat, Plumas Co., to impound tailings in Lorado Co., to impound tailings on Irish Creek; from Mrs. Bertha Sutton, in the Jackson Creek Mine, near Cromberg, Plumas Co., to impound tailings in old pits; from Simeoe Chapman, in the Dutch Mine, La Porte, Plumas Co., to impound tailings in Rabbit Creek; from Fred Lewis, in the Lewis Mine, on Rich Gulch, Plumas Co., to impound tailings in Rich Gulch; from Fred Scott, in the Arctic Mine, near Butte Valley, Plumas Co., to impound tailings in Marian Creek; from Chas. Y. Hepler, in the Miocene Mine, near Crescent Mills, Plumas Co., to impound tailings in Sneider Gulch; from Ed. Bryan et. al., in the Chaparral Hill Mine, near Saw Mill Flat, Plumas Co., to impound tailings in a dry ravine; from the Plumas Blue Gravel Mining Co., in its mine near Nelson Point, Plumas Co., to impound tailings in an old pit and on flat ground; from J. B. Higgins, in the Michigan Hill Mine, near Quincy, Plumas Co., to impound tailings in old pits and on flat ground; from Daniel Conlan, in the Pacific Mine, near St. Louis, Sierra Co., to impound tailings in an old pit; from J. M. McClung, in the Ram Creek Mine, near Brush Creek, Butte Co., to impound tailings in Ram Creek; from George Reese, in the Reese mine, near Redding, Shasta Co., to impound tailings below the mine; and from the Eureka Lake & Yuba Canal Co., in the Farrel Mine, Columbia Hill, Nevada Co., to impound tailings in worked-out pit—gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Nov. 18, 1895, at 1:30 P. M.

RUPTURE CURED!

NO DANGER. NO OPERATION. NO PAIN.

No Detention from Business.

QUICKLY! PERFECTLY! PERMANENTLY!

NO PAY UNTIL CURED.

J. C. ANTHONY, M. D.,

San Francisco Offices, Suite 86 and 87, Chronicle Building.

AMERICAN CONDENSED MILK COMPANY
WESTERN AMERICAN
99
BRANDS
SAN FRANCISCO

WANTED.—POSITION AS ASSAYER OR Amalgamator. Capable to take charge of mine and mill. Over 25 years experience. C. S. A., 1212 So. O Street, Tacoma, Wash.

WANTED.—POSITION AS ASSAYER, Amalgamator or Millman. Capable to take charge of mine and mill. Over 25 years' experience. Address ASSAYER, P. O. Box 812, Tacoma, Wash.

"CRACK PROOF"

PURE RUBBER BOOTS

Are the CHEAPEST because

They are the Most Durable.

They have been used by miners for over Twenty Years. Any one who has worn them will tell you how good they are.

BEWARE OF IMITATIONS.

See that the heels are stamped

"Union India Rubber Co. Crack Proof."

FOR SALE BY ALL DEALERS.

Manufactured only by

GOODYEAR RUBBER CO.,

R. H. PEASE, Vice-Pres't and Manager.

Nos. 577 and 579 Market St., San Francisco.

Assessment Notices.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Silver Star Mining District, Storey County, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the first (1st) day of October, 1895, an assessment (No. 20) of Ten (10c) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, room No. 69, Nevada block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fourth (4th) day of November, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on MONDAY, the twenty-fifth (25th) day of November, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada block, No. 309 Montgomery street, San Francisco, California.

IOWA MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia City, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the 23d day of October, 1895, an assessment (No. 21) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 2, No. 419 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of November, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on MONDAY, the 16th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

R. L. THOMAS, Secretary.

Office—Room 2, 419 California street, San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 2) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	298	5,000	$ 500
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	427	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	433	31	3 10
A. F. Thane, Trustee	448	1,075	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	45000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

QUICKSILVER!

FOR SALE BY

The Eureka Company,

OF SAN FRANCISCO.

ROOM 1. 426 CALIFORNIA STREET, SAN FRANCISCO.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCTOBER 22, 1895.

548,504.—ELECTRIC RAILWAY—Beach & Kern, S. F.
548,289.—STEERING APPARATUS—J. Bonner, Tiburon, Cal.
548,441.—CABLE WAY—C. Helmna, Oakland, Cal.
548,367.—SEAT AND COVER—F. G. High, S. F.
548,547.—PUNCH—C. Hood, Puyallup, Wash.
548,375.—DERRICK—O. M. Loveridge, Weaverville, Cal.
548,382.—DOUBLETREE—O. McDermott, San Jacinto, Cal.
548,265.—AMALGAMATOR—J. D. McKinnon, Portland, Or.
548,383.—SEPARATOR—J. D. McKinnon, Portland, Or.
548,261.—PARCEL CARRIER—Merriam & Scott, S. F.
548,219.—CAR BRAKE—C. B. Oviatt, North Yakima, Wash.
548,386.—GANG PLOW—O. T. Owens, S. F.
548,201.—PURIFICATION OF OILS—W. B. Price, S. F.
548,593.—HAY LOADER—Rehart & Bernard, Lakeview, Or.
548,594.—HAY RAKE—Rehart & Bernard, Lakeview, Or.
548,595.—AMALGAMATOR—A. C. Rumble, S. F.
548,463.—CAN HEADING MACHINE—H. Schaake, S. F.
548,464.—CAN SOLDERING MACHINE—H. Schaake, S. F.
548,465.—CAN—H. Schaake, S. F.
548,403.—VOTING MACHINE—T. D. Stroup, S. F.
548,478.—GATE—H. P. Talbot, Harrisburg, Or.
548,338.—WATER FILTER—W. A. Williams, S. F.
548,341.—FRUIT WASHER—J. C. Wilson, South Pasadena, Cal.
24,768.—DESIGN PENCIL CLASP—W. E. Wood, Portland, Or.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special meution:

CARPET-SEWING MACHINE.—Charles Volberg, Oakland, Cal. No. 547,191. Dated Oct. 1, 1895. The invention in this machine consists of an improved means for adjusting the looper. The machine improved upon is that shown in the Grisel patent, No. 296,844, of April 15th, 1884. The difficulty of the old means of adjustment has been the uncertainty and inaccuracy of the regulator, due to having to adjust the finger at two points, rendering it possible to adjust one too much and the other too little, and vice versa. In the present improvement the finger piece is adjusted by the operation of a single set-screw, whereby both the necessary adjustments can be effected accurately and with facility. The improvement consists of the combination with the frame provided with a fixed lug, a reciprocating needle and a looper-actuating lever, of a looper having a shank journaled in said lever, and means for adjusting the looper relative to said needle, comprising a two-armed bar fixed to the looper shank, a regulating lever pivoted to one arm of said bar, having one end nominally in contact with an extension of the actuating lever, and its other end in position to contact with said lug, adjusting means carried by said regulating lever and co-operating with the other arm of said bar, and means for holding the latter arm in yielding contact with said adjusting means.

SAFETY GUARDS FOR CARS.—Harlan H. Henley, San Francisco, Cal., assignor to the Henley Car Fender Co. of same place. No. 547,258. Dated Oct. 1, 1895. This invention relates to an apparatus which is especially adapted for application to street cars for the purpose of preventing human beings and other objects from passing beneath the wheels of a moving car. It consists of a framework projecting forward from the car body, having a swinging guard suspended from the front. This guard has its rear end connected with a trigger or disengaging device, which, in turn, operates the fingers by which the object is to be picked up. These fingers are flexible and horizontal, having the tips moving vertically and independently so as to yield as they pass over the surface when depressed thereon. These fingers are attached to fulcrumed finger-bars, which, in turn, are connected with the tilting levers upon the frame above, and the fingers are normally held a short distance above the surface while the car is traveling. If the swinging guard strikes any object, it disengages the latches, and thus drops the fingers immediately upon the surface over which they move so closely that any object in front of them will be picked up and will rest upon the table or support at the rear of the fingers. Each finger has a sliding, independently movable, spring-actuated tip so constructed as to yield and also to raise any particular finger in case it strikes an insurmountable obstruction, while the fender is resting upon and moving over the surface of the ground.

CONCENTRATORS.—Jehu Jacobs, Henley, Cal. No. 547,640. Dated Oct. 8, 1895. This invention relates to an apparatus for separating valuable, precious and heavy metals and sulphurets from worthless sand or tailings. It consists of inclined suspended tables, over which the material to be separated is caused to flow, a longitudinal crank shaft, a transverse shaft geared thereto, connections from the longitudinal shaft to the table, and a cam on the transverse shaft, a fulcrumed lever having an arm connected with the table, and a second arm in the path of the cam whereby the tables are caused to oscillate sidewise and endwise, and the tables at the same time are given a slight shifting or tossing motion. In conjunction with this are screws or mechanism whereby the angle of inclination may be adjusted, and a bumper whereby the return of the table is abruptly stopped after it has been moved forward.

THILL COUPLINGS.—Hugh Gaw, San Francisco, Cal. No. 547,637. Dated Oct. 8, 1895. This invention relates to a device for securing shafts or thills to carriages. It consists of axle clips having chambered extensions at their front, and shaft irons having cylindrical heads adapted to fit the chambers of the extensions, springs fulcrumed to the clips below the chambers, bars or keepers engaging the springs at a point above their fulcrum points, whereby the springs are clamped in place so that their upper ends form contact with the shaft irons and retain the shafts elevated to prevent their being disengaged.

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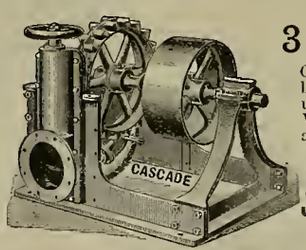
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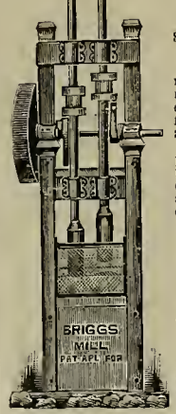
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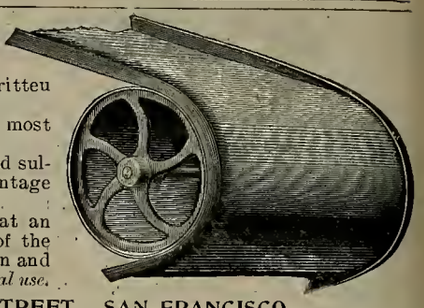


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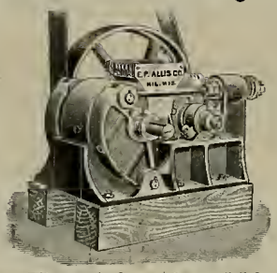
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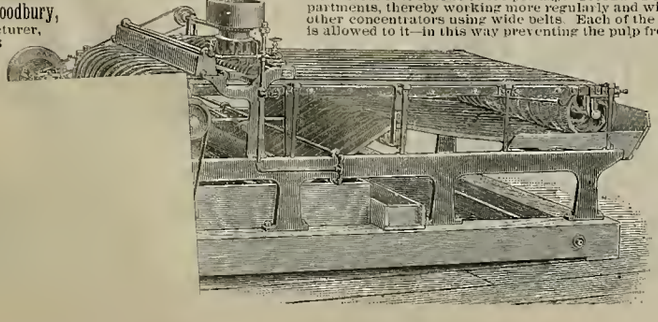
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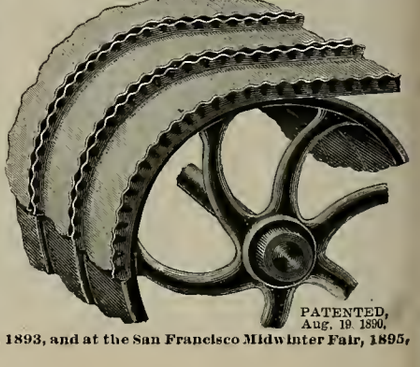
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The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect. Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

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This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1895.

MINING AND SCIENTIFIC PRESS.
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SAN FRANCISCO, SATURDAY, NOVEMBER 9, 1895.

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Artificial Stone and Concrete Work.

The time when Art's proudest triumph was to imitate Nature has passed. There is no longer imitation in the industrial arts, but in many cases substitution and improvement. In the matter of stone the slow processes of natural accretion have been hastened by artificial combination of mineral elements and while yet plastic the product has been moulded into shapes of use and beauty, with an economic saving and without loss of wearing value. The accompanying illustrations give a good idea of the appearance of one form of artificial stone and concrete work now being extensively used in this State. The work portrayed is in southern California, where Gray Bros. of this city, who have contracts for the work herewith illustrated, have employed from 300 to 500 men. Though not as massive as the great aqueducts of Rome—which, after the lapse of 2000 years, still serve in places the purpose of their creation; yet the southern California irrigating canals are of more present utilitarian importance and will endure in that mild climate long enough to return many thousand per cent on the original investment. The engravings give a good general idea of the appearance of the work during construction and the finished structure. The Gage canal at Riverside is over eighteen miles in length; the ditch is five feet wide on the bottom, twelve on the top and five feet deep. The fact that after cementing the flow of water doubled in volume is indicative of the value of such work wherever practicable.



TWELVE-MILE CEMENT CANAL AT AZUSA.

From J. J. Crawford, State Mineralogist, is received Bulletin No. 6, "California Gold Mill Practices," written by Edw. B. Preston, M. E., field assistant, published at the State Printing Office. It is an 85-page pamphlet, similar in excellence of a practical character to other publications of the State Mining Bureau. As in the case of those treatises, it is published in response to a general inquiry for further up-to-date information on the subject treated. Practical points as to mill site, mill construction, the details of the several parts, the manner of procedure throughout, are given, together with illustrated descriptions of California appliances, many of which have stood the severest tests and proven themselves worthy of their general adoption and use. Any citizen of this State may obtain a free copy by sending three cents for postage with his application to the California State Mining Bureau, No. 24 Fourth St., San Francisco; the price of the pamphlet to those living outside the State of California is fifty cents, which sum should accompany the order.

It is wired from Visalia that an enterprise now in progress there would be prosecuted at a much faster rate were the superintendent able to secure sufficient mining machinery in this city, but that San Francisco "was fairly stripped of those articles, owing to the unprecedented revival of mining." While it is gratifying to note such demand, it is believed that diligent quest among the manufacturers and dealers in supplies would enable any one to secure all necessary requirements in that line.



TWELVE-MILE CEMENT CANAL AT WHITTIER.



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J. F. HALLORAN.....General Manager

San Francisco, November 9, 1895.

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At the time the obnoxious rules of July 9th, 1894, were promulgated it was said to the editor of this paper by a department official at Washington that the real intent was to make many hangers-on let go, or get a United States patent. The alleged intent was unlikely, the connection between the two being indefinite. But it is a fact that too many delay in securing patents. Wherever practicable, it is good business for the holder of a mining claim to get a U. S. patent for it. If he wants to hold it, he can do so in peace; if he wants to sell it, nothing, not even the proven value of the claim itself, will so aid in the sale as the ability to show the prospective purchaser a United States patent for it. In many a buyer's mind the question of title is uppermost, and if he can be sure he isn't buying a lawsuit he will be more likely to close the bargain. It does not follow that the purchase of an unpatented mining claim involves probable litigation, but it is certain that a man who has a United States patent for a claim stands a better chance of selling it, if so disposed.

One year ago a prominent Butte, Montana, copper man said he expected to see copper go to six cents inside of six months. Since then it has gone from nine to twelve cents, and the great demand in the electrical industrial field justifies the belief that unless new developments are made or old ones reopened the red metal will go higher. Men who have long mined copper say it can be now produced at a profit of four and oue-half cents. Probably when all things are considered this is a low figure, but it is almost demoustrable that at twelve cents there is an average 100% profit to the producer. Hence the quest for copper is second only to the present pursuit of gold. California's copper deposits are being exploited anew and on the other side of the Sierras our Nevada ueighbors are fully awake to the advantages possessed in copper veius which for the last twenty years have been unworked. As late as 1882 the Esmeralda Smelting Co., at Copper Mountain, on the Carson & Colorado road, turned out 300,000 pounds of copper, the last produced in the State, as the price, which had run down from twenty-four ceuts a pound, precluded any possible profit. Since then the cost of production has decreased, due to improved metallurgical methods. There are few parts of Nevada's 100,000 square miles that do not coutaiu copper belts of varying value, though it is doubtful if in such a sparsely settled State, even at the present relative prices of production and sale, their output could he made profitable because of transportation cost. The northern part of the State is more fortunate in transportation facilities, and it is believed that an up-to-date smelter built with reference to freight charges would be a profitable Nevada enterprise.

It will be remembered that some months ago Commissioner Lamoreux, of the General Land Office, dismissed a protest filed by E. H. Benjamin against the patenting of sundry tracts of mineral land to the Southern Pacific Co. The matter was commented on as being characteristic of that official, who has throughout evinced a desire to favor the corporation in its attempted absorption of the public area, and the belief expressed that were the committee on mineral lands of the California Miners' Association to appeal the case to the Secretary of the Interior justice might be accorded. It was so appealed. Last Tuesday the Secretary of the Interior affirmed Commissioner Lamoreux's decision. He accompanies his affirmation by language that indicates his bias. He argues the question, not in a judicial manner, but as an advocate of one of the parties in controversy, and plainly shows his desire to deny the miners a fair hearing. He even goes out of his way to defend his rules of July 9, '94, and absurdly argues that there is no need for a mineral land commission in this State similar to that created for Montana and Idaho, and now contemplated by legislative bills drawn up by the committee of the association which has in charge that branch of the work. He begs the whole question and detracts from the dignity of his high office by puerile comparisous and assumptions. The railroad corporations of this State are to be congratulated on having such powerful assistants as Messrs. Smith and Lamoreux, who happen to be in positions that empower them to attempt injustice. Ordinarily such service commands returns commensurate with the contempt which attaches to men who so degrade their official positions. Mr. Smith's nimble haste in reaching matters in two weeks that usually take a year to reach is also noticeable. His zeal should commend itself to those who can appreciate and reward it. Throughout, the plain fact is ignored by both Commissiouer Lamoreux and Secretary of the Interior Smith that the Miners' Association assumed nothing, simply pointed out the falsity of the assumptions of the railroad corporations, protested against such assumptions being taken as facts, and asked for an examination of the question itself. It is apparent that the same haste which has characterized the affirmation of the Commissioner's dismissal of the protests will distinguish immediate effort to have all the lands in question patented to the railroad company before Congress meets next month. While in such an event proceedings might be instituted for annulment because of manifest fraud, yet it is possible to forestall the necessity for such action by a final appeal to the President of the United States, who personally promised the association's representative that he would see that justice was done in the matter. Justice is all that the miners ask, and so far in this matter it has been steadily denied them. It is further believed that those rules of July 9th, '94, under which all this unfair surrender of public lands is attempted hy corporate and assisted by Government officials, are *ultra vires*—outside the jurisdiction of the land department and proper only to the courts. The committee on mineral lands will have a meeting next Monday, the 11th, to take action thereon.

Old-time Nevada acquaintances of Jos. T. Goodman hear with surprise and delight that that genial journalist has signalized some recent years of study hy working out the whole system of numeration and chronology of the ancient Mayas. The work involved infiuite care and a certain amount of drudgery, and in devoting so many years to the effort Mr. Goodman deserves the fame that will assuredly accrue to the man who has done for Central America what Rawlinson and Champollion did for Egyptian hieroglyphics. Squier, Strain, Rogers and other explorers long ago made us acquainted with the fact that in Central America exist evidences of a prehistoric civilization that rose and endured and passed away many thousand years ago. The ruined cities, the stupendous testimonials of skilled habitants, attest the existence of a people whose origin or obliteration is as vanished as the morning mists that melt into the infinite azure, but their records in stone hitherto undecipherable presumably give the salient points of their history. Twelve years of patient toil has enabled Mr. Goodman to read these records and reconstruct the history of a people who had disappeared from the earth before Assyria had risen or Egypt had thought of pyramids. He is about to publish in London three hooks, the result of his labors; it is a matter of regret that such publication should not be a Californian one, and a matter of some local shame that a local institution so ahle as the California Academy of Sciences in this city should not have had a direct or indirect share in the work. No similar institution in the United States is so richly endowed, and no similar institution shows so little life. In place of being the center of scientific activity in a country that incites and rewards scientific research, it lies like a snail in a shell, enjoying all the profits and emoluments of Jas. Lick's munificent endowment, and content with heing a little mutual admiration society. Mr. Goodman's work will appear next year and will attract universal attention to the most ancient civilization of which there is any record extant.

The South African *Mining Journal* furuishes figures showing that the total tonnage crushed by all the mills of the Witwatersrand district from its discovery until the 30th of last June was 11,500,000 tons, from which was secured 7,651,935 ouuces. It argues that by the present system of wet crushing and mercury amalgamation ten per cent of the gold in the ore crushed was unneccssarily lost, and, on the principle of the Montana man who annually lost $5000 by not having hogs to fatten on dropping acorns, our South African contemporary figures an annual loss of £2,160,000, and, unless improved methods are adopted, argues that the loss in the next decade will he £28,000,000. Apart from the created atmosphere of fancy in which the *Journal* flaps its wings, its remarks as to past losses are worthy of uote. The loss of gold was long a matter of serious conceru to California miners, who have of late years devised means hy which such loss is reducod to a minimum. A California miner—Charles Butters—in charge of one of the biggest concerns in South Africa—the Rand Central Ore Reduction Co.—has a project to increase the secured percentage of gold in the ore that company treats, £40,000 having been appropriated for the erection of a plant where efforts in that direction are justly expected to achieve the same measure of success met with in similar propositions elsewhere. In this regard it is to be noted that California experience has sometimes been to the effect that the recovery of the "submerged tenth" of the gold was too costly to he continued. While from a scientific or metallurgical point of view it was eminently satisfactory to show that the resultant slimes contained less than five per cent of the gold in the ore, yet the practical workings of the plan suggested that if it cost $10 additional to get $6 in gold additional, it would be more economical to let it go in the dump. It is, however, on such experimental work that ultimate practical success is hased, and the South African operations will be of interest. When Gardner Williams had charge of the cyanide plant of the Crown Reef, in the Witwatersrand district, he projected a somewhat similar form of treatment for the 80,000 tons of slimes in that company's control, estimated to contain 3½ dwts. of gold to the ton, or nearly 10,000 ounces.

By order of the Secretary of the Treasury no more silver dollars will be coined at the United States mints after next Saturday. This, virtually, converts all the silver bullion now held by the government into gold obligations. Of this silver bullion the United States Treasury uow holds 137,644,000 ounces, which cost the government $124,080,323; its present coining value would he ahout $175,000,000. In connection with this matter it is worthy of note that the statement so generally made, that silver dollars are directly redeemahle by the government in gold, is not so. Silver dollars are not redeemable in any other form of money. Silver certificates are redeemahle hy the government in silver dollars only. It is, however, further to be observed that in practice silver dollars are readily exchangeable for paper money, and the latter are eaiily couvertible into gold. But the greenback is the only government jorm of exchange or money, other than gold, which is directly redeemable by the goverument in gold when so demanded.

Concentrates.

THREE new papers made their appearance in Leadville, Colo., last week.

GOVERNMENT statistics place the cost of producing copper at 4½ cents per pound.

THE Alma, Amador, M. Co., near Jackson, will sink their shaft 600 feet deeper.

THE Church Gold Mining Co. paid a dividend of five cents per share on the 7th inst.

THE new mill at the Golden Cross, San Diego Co., is the largest under one roof in California.

FELIX CHAPPELLETT is about to incorporate the Eureka mine on the Forest Hill Divide, Placer Co.

THE silver production of 1894 had a coining value of $84,000,000 and a commercial value of $31,422,000.

LONDON mining papers estimate the Rand, South African, gold output for '95 will approximate 2,300,000 ounces.

LAST Monday the Ontario, Utah, Company shipped to San Francisco 51,516 fine ounces of silver.

ON the recommendation of experts the Oneida mine shaft, near Jackson, Amador county, is to be sunk to a depth of 1700 feet.

J. L. HALEY and E. M. Price have bonded the Sunnyside mine, West Point, Calaveras Co. A five-stamp mill is to be erected.

MR. ISAAC'S, now known as "Barney Barnato," the South African mining magnate, is reputed to be possessed of $150,000,000.

THE closing of the New Orleans mint leaves only two United States mints in operation in this country—Philadelphia and San Francisco.

MOST of the Klamath river miners have pulled out for the season, to save their wheels and apparatus from a probable December freshet.

PRELIMINARY steps have been taken for the establishment of a 200-ton matteing plant at Rossland, B. C., for the reduction of Trail creek ores.

THE contract for running the Butte Basin Mining Company's new tunnel at Butte City has been awarded to J. Phillips of Placerville, Cal.

THE Redding land office has received notice that patents were issued October 9th to the C. P. R. R. Co. for about 65,000 acres of land in Siskiyou county.

GOVERNMENT special timber agents are making rigid investigations concerning the cutting of timber on government land in this State and Montana.

SUPERINTENDENT SMITHERUM of the Golden Gate mine, near Sonora, Cal., has determined to put in twenty new stamps. The cost will be upwards of $15,000.

THE Nevada County Tailings Co. has bought on a $10,000 basis patent rights of a process to work tailings, and propose to put it in operation in Sierra and Nevada counties.

THE hoisting works on the Midday mine, on the Grass Valley road, were totally destroyed by fire last Tuesday afternoon. The mine is owned by C. R. Clark.

THE Grass Valley *Union* bears that Mrs. Huntington intends starting up the old Banner mine, which was worked by her brother, Earl Brown, several years ago.

THE *Bee* says Yuma county, Arizona, is going to have two more good mines at Gates' Landing and Thomas camp. Mills will be put up at both places within six months.

THE air compressor at the Frisco mine on Canyon creek has been completed. It is the largest in the State of Idaho, being 500 horse power. The plant was started up last week.

DESERT QUEEN, San Bernardino Co., mine owners have settled their squabble. H. B. Adsit, of Colorado, has been appointed superintendent, and work will be resumed next week.

LABOR COMMISSIONER FITZGERALD has an order for 100 teamsters from the Mountain Mining Co., Shasta county, and one for twenty miners to go to El Dorado county, at $2.50 per day.

CAPT. PLUMMER has bought the Black Hornet mines, eleven miles from Boise, Idaho; the stated price is $100,000. A daily carload of $40 ore is now being shipped to Denver and Salt Lake.

THE Merrill Gold Mining Company has incorporated. Capital stock, $100,000. Directors—J. F. Cowan, T. P. Newton, Butte; J. M. Merrill, Oakland, Cal. They will operate at Basin, Montana.

AN exploring party finds that the reported volcano in the Olympic mountains proves to be the burning of dead timber in a deep ravine where there was also a lead of lignite coal, which was ignited.

IN a part of San Diego county, this State, comprising nearly 3000 square miles there are six lively mining camps, but in that entire region there is no justice of the peace—probably because there is no need of any.

A RECENT judicial decision is to the effect that if work is renewed on a claim after it has been open to relocation, but before relocation, the rights of the original owners stand as though there had been no default.

MESSRS. RIDEOUT AND HAGGIN have finally decided to work the Pershbacker claim themselves. It is in Butte Co. and was extensively advertised in this city some time ago. A shaft is being sunk to tap the old river channel.

THE *Bulletin* says it is expected that the report of the Boston & Montana Mining Company for the calendar year of 1895 will show a surplus of $750,000 after paying $7 per share in dividends, and ground opened for eight years ahead.

STATEMENT is made that the item in last week's issue regarding the reported sale of the Black Oak mine to N. S. Wright for $60,000 is not wholly correct. It is stated that the group of three mines cannot be bought for less than $800,000.

DURING September the Simner & Jack mine, Johannesburg, South Africa, crushed 11,820 tons, obtained 5472 ounces of gold from mill, 599 ounces of gold from chlorination, and 1712 ounces of gold from tailings by cyanide. The month's profit was $64,000.

MINERS returning from Cook's Inlet, Alaska, tell of great wealth secured at Canyon creek, thirty-five miles from tidewater, where dirt was found which went "$50 to the pan." They deny former stories of starvation and say they will go back next spring.

AN item in last week's "Concentrates," regarding the App mine in Tuolumne Co., would have been more exactly in accordance with the facts had it been stated that the 20 stamps recently erected there are not in addition to any mill heretofore built there.

THE capital stock of the Rawhide Mining Co. of West Va. is $5,000,000; the property has been transferred from the Guild Gold Mining Co. to the new corporation, and will be listed on the Boston Stock Exchange. The present output is stated to be $84,000 monthly.

THIRTY German business men of San Francisco were given a reception at Nevada City last Saturday, when they arrived to inspect the Home and Cadmus mines, which they are developing. The properties are situated near the Providence and Champion mines.

CAVE COUTS of San Diego has bought the Ranchito mine at Julian for $5500; a twenty-three ton crushing averaged $35. The Cable mine close by the Ranchito will shortly be started up. Alfred James of Los Angeles has bonded the Golden Rule mine in that vicinity.

H. C. STEELE, J. M. S. Egan, J. F. Hook, G. S. De Line, J. W. Nance, C. Vermason, Jas. Patterson Jr., W. F. Bray and Wm. Newport of Perris, Riverside Co., Cal., have incorporated the Perris Mining and Development Co., capital stock $250,000; $15,000 subscribed.

C. C. RUSS expects to have 70 or 80 men at work on the Gold Basin placer mine, not far from the boundary of Josephine and Curry counties, before long. The trail is almost completed, and as soon as that is done work will commence on the ditch, says the Kerbyville, Oregon, *Union*.

THE Temple Bar (Arizona) Company have had their machinery examined by a hydraulic engineer, who reports that the machinery will not stand the immense strain that will have to be put on it when attached to the pumps and as a consequence new machinery will have to be put in.

THE Secretary of the Interior has recommended to the Attorney-General that suit be brought against the Oregon and California Railroad Company, to recover certain lands erroneously patented to the company, situated in the Roseburg, Or., land district, which the road refuses to relinquish.

THE Indians of Metlatahktla island, where gold quartz mines were recently discovered, have won their case in the Department of the Interior against Captain Carroll and others, who sought to develop the island claims. The aboriginals can now work their property or allow it to lie dormant.

A. G. SMITH, formerly of Deadwood, South Dakota, is operating a ten-stamp mill on the Philippine islands, and writes that he got the mill started, but on account of a scarcity of water could only run five stamps. From a twelve hours' run of five stamps he cleaned up three-fourths of a pound of gold.

HON. J. H. TURNER, Premier of British Columbia, is given as authority for the statement that the Rothschilds and Baron Hirsch have taken part in a syndicate which has for its object the development of the mining of that Province. For this purpose $500,000 is said to have been already subscribed.

THE next meeting of the California Debris Commission, to consider applications for hydraulic permits, will be on the 18th inst. In this issue are advertised applications to impound tailings from 17 different companies and individuals resident in El Dorado, Plumas, Sierra, Butte, Shasta and Nevada counties.

UNDER the act of February 28, 1878, known as the Bland act, 291,272,018.56 ounces of fine silver were bought at a cost of $308,279,260.71 and coined into 378,166,793 silver dollars, against an equal portion of which 338,000,000 of silver certificates have been issued, $330,000,000 of which are still outstanding.

THE Placer County Miners' Association reports balance on hand at the beginning of the term, $318.71; receipts during the year, $1277.25; total, $1595.96; entire expenses of the association for the year, $45.70; sent to the State association, $1000; loaned it, $400; total to the State association, $1400; balance in the treasury, $150.26.

DURING October the Alaska Treadwell mill ran twenty-nine days and crushed 20,321 tons ore; 390 tons sulphurets were treated, of a value of $23,636. The bullion produced from ore and sulphurets was $72,467. The ore averaged $3.72 per ton. The expenses were $24,845. The company paid a quarterly dividend of $75,000 on the 28th ult.

AT Stockton the Red Cloud Mining and Milling Co. has incorporated to operate the Red Cloud mine in Amador county; capital stock, $1,000,000; directors, C. A. Brown of San Francisco, C. M. Jackson, D. R. Oliver, W. Campbell, R. H. Eudicott and J. Campbell of Stockton, and J. L. Bryson, C. Zinck and F. Kidd of Plymouth, Amador county.

"I WOULD as soon do without my dinner as miss reading your paper," writes a Chewelah, Wash., subscriber; "Though I note an occasional mistake, I think there is an honest effort to be exactly truthful," says a Los Angeles reader: "I consider the MINING AND SCIENTIFIC PRESS absolutely essential to my business," writes an Amador Co. mining superintendent. Such appreciative remarks received so frequently are duly valued.

THE Placer *Republican* ironically says: One reason why Placer county mines have not received deserved attention from capitalists is that her mines are too close to the railroad. Capitalists are always seeking phantom wealth in some inaccessible country, but a year or so will change all this. Such mines as the Zantgraf, Pike Bell or Black Oak, Marguerite and others will instill confidence into men of wealth and they will seek investments there.

ILLUSTRATING the general increase of business consequent upon activity in the mining counties, the following is taken from the Trinity *Journal*: "There has been more than the usual amount of freight hauled to this county this fall, in the shape of mining material, etc. We learn that an average of 100,000 pounds per week has been and is being delivered, outside of the winter supplies of our merchants."

THREE-DOLLAR MEN at the Diamond Hill mine, St. Louis Gulch, Montana, have struck for $3.50. The mine is a tunnel into the mountain with a raise to the surface, making a vast quarry. Miners break down ore for a forty-stamp mill. The company offered to pay the miners $3.50, but would not accede to the demands of the shovelers. Forty men are out. The engineers and amalgamators were paid $4 per day.

MINING in San Diego county is looking up. A good deal of outside capital is going in. Large bodies of low grade ore have been uncovered in many localities. One mill is reported as turning out $35,000 monthly from this grade of ore. Up to date the Julian district has produced about $3,000,000 from its mines.

THE El Dorado *Republican* says: There are any quantity of mining men in the county, some of them with money and some without it. Many are prospectors looking for diggings because work is scarce in the valleys and the wages so low that they believe they can make more money with the pan and rocker than by hiring out.

ONE of the saddest sights the Colfax *Sentinel* knows of is to see a good mine handled by a man who never worked in one. A man who has not the practical experience, with a little engineering skill combined, will ruin the best mine in the State. Drift mining is a science and the sooner scientific methods are applied to it the sooner will so many bungling failures cease to attract attention.

S. H. HAYES, W. V. Jobes and L. L. Westfall have incorporated the Dixie Mining Co. at Spokane, Wash.; capital stock, $250,000. D. Shondy and J. G. Boyle have incorporated the Peshastin Mining and Milling Co. at Ellensburg, Wash.; capital stock, $100,000. A. C. Brokald and C. S. Fogg have incorporated the Washington and California Mining Co. at Tacoma, Wash.; capital stock, $12,000.

THE Grass Valley *Union* is informed that the French syndicate, of which M. J. Zampella is the promoter, has made a payment of $5000 on each of the following properties which they have bonded: The Allison Ranch and Daisy Hill mines of Grass Valley and the Champion and Providence mines of Nevada City. A cablegram has been received from M. Zampella that a company has been formed to complete the purchase and operate the mines.

ENCOURAGED by the success of the Diestlehorst Bros., in the upper Sacramento, four Oaklanders have built a boat at Alameda Point, organized as the Golden Sands Mining Co., and propose to dredge along the American and Feather rivers. The Lottie is 20x65, draws two feet of water, is flat-bottomed, has a 30 H. P. gasoline engine, and cost $5000. Tolman & Wickman are the captain and mate; they figure on handling fifty tons of sand per day at a profit of $2 per ton and are enthusiastic over the prospect.

FROM Australia come reports of an Adelaide inventor who, it is said, has devised a new form of light stamper battery in which several systems of springs are brought into play, enabling the cams and cam shaft to be entirely dispensed with. In the past, springs have been used to accelerate the downward blow of the stamp, but the special object of the present gear is to assist the upward stroke of the machine and to take full advantage of the rebound and of the molecular elasticity of the parts.

UNDER date of September 30th, John Hays Hammond writes to the London *Mining Journal* from Johannesburg, South Africa, "I have no connection with the syndicate 'Hammond's Matabeland,' referred to in a recent issue of your journal. The A. R. Hammond referred to has been represented as a prominent mining engineer of the United States, and of South Africa. Despite many inquiries among prominent American mining engineers here, I have discovered no one who had ever heard of Mr. A. R. Hammond as a mining engineer."

PROF. WM. P. BLAKE, recently appointed Director of the School of Mines, University of Arizona, has been selected by the Executive Committee on Awards of the United States Columbian Commission, to prepare the report on Gold and Silver Mining; the Accessories, Processes, etc., for publication in the official final report to Congress upon the World's Columbian Exposition at Chicago. He invites exhibitors to send him at Tucson a list of the exhibits made by them, with a full description, together with any printed circulars or pamphlets relating thereto, in order that the report may be made as comprehensive and complete as possible.

THE United States custom house at Northport reports that about seven carloads of ore, of 40,000 pounds each, pass through from the Pilot Bay smelter every week, worth $16,800. The duty on imports from that point at a cent per pound, if all collected there, would amount to $30,000 a month, but a large proportion of the bullion goes through on warehouse entries. The actual collections are about $20,000 a month. There has also been imported from Trail creek during the six months ended September 30th 40,000,000 pounds of ore, containing gold, silver, copper and iron worth $1,200,000, on which there was no duty, for the iron was of no commercial value.

MARCUS DALY, general manager of the Anaconda Company, denies the report that the sale of a fourth interest of the company's stock involves a change of management or that he is going to resign. He says: "After a most thorough examination by experts, we have sold one-quarter of the capital stock at a price that makes the properties worth $30,000,000. Since then part of this quarter has been sold in New York and London at a price which makes the property worth about $37,000,000. No larger interest than this quarter was ever offered for sale." He says that the Anaconda Company in its operations has paid out in Montana, since 1878, $72,000,000, and that the operating expenses and cost of supplies in 1894 was $6,500,000.

TALKING of the South African gold excitement, M. Paul Leroy Beaulean of Paris, France, observes: "Undoubtedly a great many investors will suffer in the end, but this is the price that has to be paid for all great financial and commercial movments. The Rand has opened up an enormous field for the active employment of French capital, which has for too long a time lain, like the talent in the parable, wrapped up in a napkin, and the only way to use it profitably is to boldly risk it. Some of the money would be lost in the great channel of speculation, but by far the greater part cannot fail to be extremely productive, not only to the investor, but to the country generally. Where the money goes there follows trade—in point of fact, the gold fever is the salvation of French finance, and this is beginning to be understood by French investors, who have unbounded confidence in the future of gold mining."

The Sampling and Measurement of Ore Bodies in Mine Examinations.

NUMBER III.

By EDMUND B. KIRBY.

Three methods of cutting are used in the reduction of mine samples.

1. *Shovel-Cutting.* The pile is shoveled over, one shovelful out of a certain number being taken to make the sample. The ratio depends on the bulk and the accuracy required, but may be, say, one in ten for a bulk of over five tons, one in three for 1,000 to 2,000 pounds, and one in two for smaller quantities. The latter is the ratio used in most cases even for larger amounts.

2. *Quartering.*—The pile of ore, thoroughly mixed, symmetrical in shape and with the coarse and fine symmetrically distributed, is flattened and divided into quarters, two of which are taken.

3. *Riffle Cutting,* or "splitting," on a hand-riffle. The size preferred for most underground work has several parallel troughs 1¼ inches wide, and the same distance apart, so that it may be used whenever the sample has been crushed small enough to pass this space. Riffle-cutting is the most accurate and generally the most rapid method in use.

Choice of Cutting Methods.—Shovel-cutting is specially adapted to a large bulk, but when this becomes small, say 150 pounds, it requires too much labor and skill to insure accuracy, and either of the other methods is used. In the absence of a riffle, the work is finished by quartering, but otherwise the riffle is taken as soon as the lumps are small enough. Quartering is therefore used in the intermediate stage when the bulk is too small for rapid shovel work but not yet ready for the riffle.

Assay Office Work.—The assayer is always instructed as to the crushing size and further reduction of the sample package to the final assay pulp. From his result the assay value of each sample is so calculated as to conform to the plan of cost estimate adopted.

Sorting Tests.—In mines where the ore broken and hoisted must have its richer portions sorted out to make a marketable product, it is necessary to determine the percentages of total value and of tonnage which are thus available. Sorting tests are made upon the mine samples, using those coarsely broken portions which were rejected during the first operations of reduction. These are mixed proportionately to form a few group samples, and experieuced ore sorters from the neighborhood are put to work upon them. All the resulting products from sorting each sample are then weighed or measured to determine their relative weights and each product reduced to the assay office package. When underground sorting is done the results of this are also determined.

Mixtures for Analysis.—Since the market value of smelting ore depends largely upon its chemical composition, proportional mixtures for analysis are prepared from the final pulp samples of all such ore.

Metallurgical Tests.—When metallurgical tests are required, such as those for concentration, free-milling pan amalgamation, wet processes, etc., proportional mixtures are made for the purpose, often out of the rejected portions of the mine samples. In securing mixtures for tests on a large scale the difficulties incideut to mill-runs are kept in view.

Ore bodies frequently contain occasional streaks or pockets of high grade silver minerals or metallic gold, and a sample here and there may chance to include one of these, thus giving an assay far above the general average. Since all the samples taken are at best few in proportion to the mass represeuted, the error iutroduced by averagiug in such assays may be very great. It is therefore necessary after plotting the assay results to reject such values, and some arbitrary figure corresponding to a mean of the next adjoining samples is substituted for use in averaging.

It is here necessary to call attention to the danger incurred in the practice of uniting a number of samples and assaying the mixture. It is practically impossible to mix in correct proportions, and this plan also fails to furnish the necessary information about the distribution of values and the limits of pay ore. The results are also liable to serious error from excessive samples as explained above.

THE MEASUREMENT AND ASSAY VALUE OF SECTIONAL AREAS.

All the plane sections which have been selected to serve as the basis of measurement are plotted to scale. The drawing of each section includes all workings, measurements and ore limits shown, together with the sample lines and the figures of their length and assay value. Upon the section is then sketched that portiou of the ore body which, according to judgement, is safely proven by the mine workiugs within the plane of section, aud may therefore be considered "in sight." In this operation a variety of problems are presented, those commonly occurring being illustrated by the typical cases shown in Figs. I to VII.

In each figure the outer heavy black line shows the actual ore body. The heavy dotted line is the limit decided upon for the portion in sight. Within the thiu black lines are the portions supposed to be pay at the time of measurement, and therefore sampled. The shaded areas show the actual pay ore as finally fixed by the sample results.

Fig. I is the section of an ordinary vein presented in a level where the entire thickness of the ore body is visible.

In Fig. III, the actual bounding surface of the body appears at *A*, *B*, *C*, and thus indicates the most probable direction to be given to the curved line limit for ore in sight.

In Fig. II, where no boundaries are disclosed and the ore has no definite structure to guide the judgment, the curved line *A*, *B*, *C*, is taken.

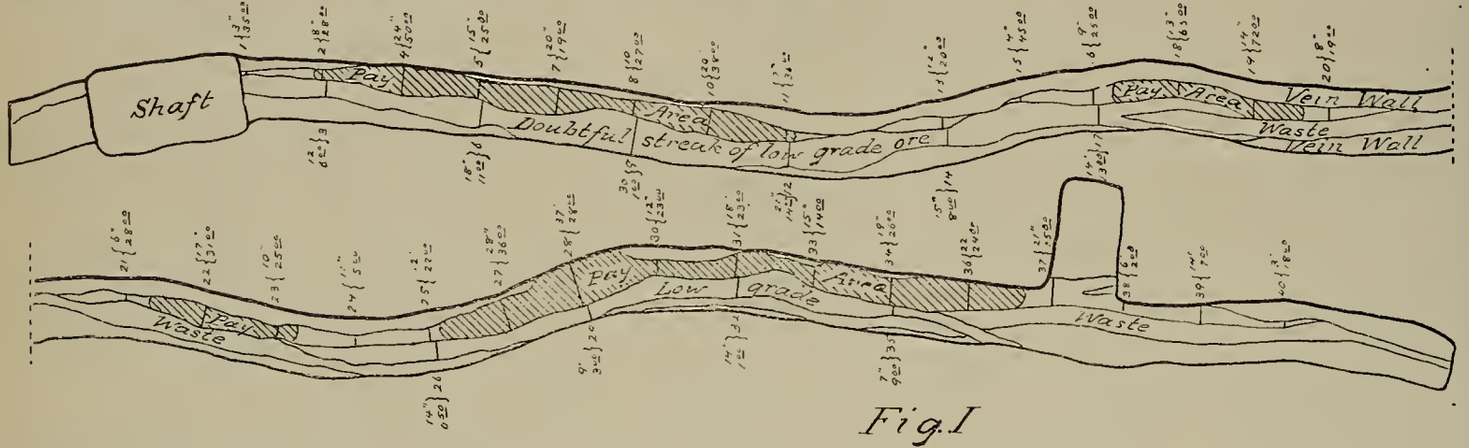


Fig. I

Section of thin Vein, exposed in a level

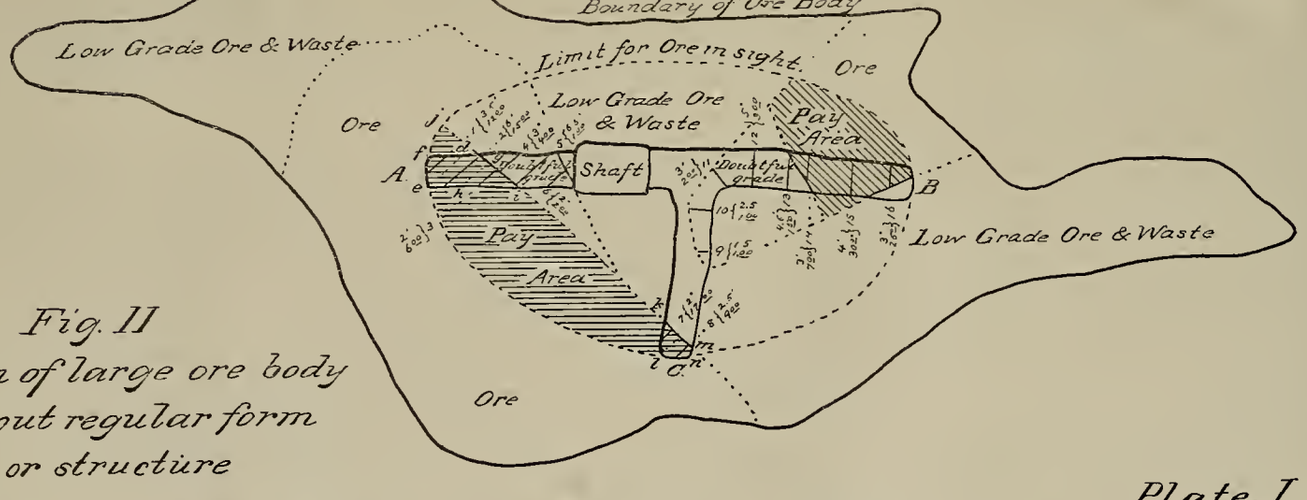


Fig. II

Section of large ore body without regular form or structure

Plate. I

In Fig. IV, the ore body is an irregular mass whose contents are arranged in streaks or layers definite enough to justify the limit *a*, *b*, *c*, *d*.

Fig. V shows a thick sheet composed of regular layers in which the limit *a b c d* may be taken if the entire mass is pay ore, but if it is limited to a few streaks like the two shown, their continuance is less certain and *a b f d* is taken.

In Fig. VI a thick sheet of ore in layers is shown by the single crosscut *K* in the long level *e f*. In drawing the limit *a b c d e f g h*, it is a matter of experienced judgment how much of the sheet is really proven by this crosscut, and how great a length may be given to *a b*.

Fig. VII is a similar sheet, in which the layer-like structure of the ore body warrants the limit *a b c d*. When including areas not actually visible, care must be taken that no one is of such excessive value that its possible variations will introduce a serious error into the final total estimate.

The actual pay areas as included within the intended stopes are determined from the assay values of the samples. Whether these are above or below pay is generally evident from inspection of the values as they appear upon the section drawing, but in many cases it is necessary to make an approxi-

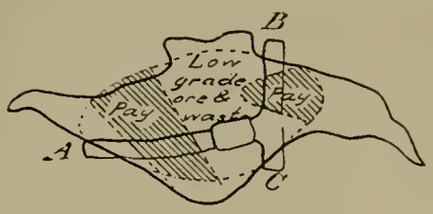


Fig III

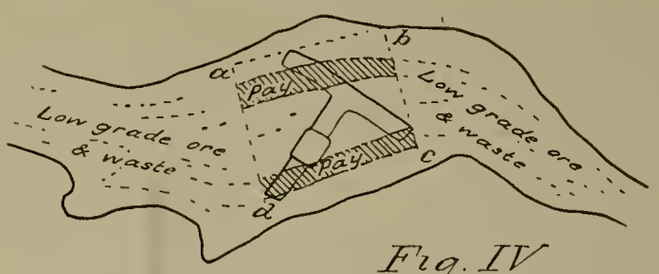


Fig. IV

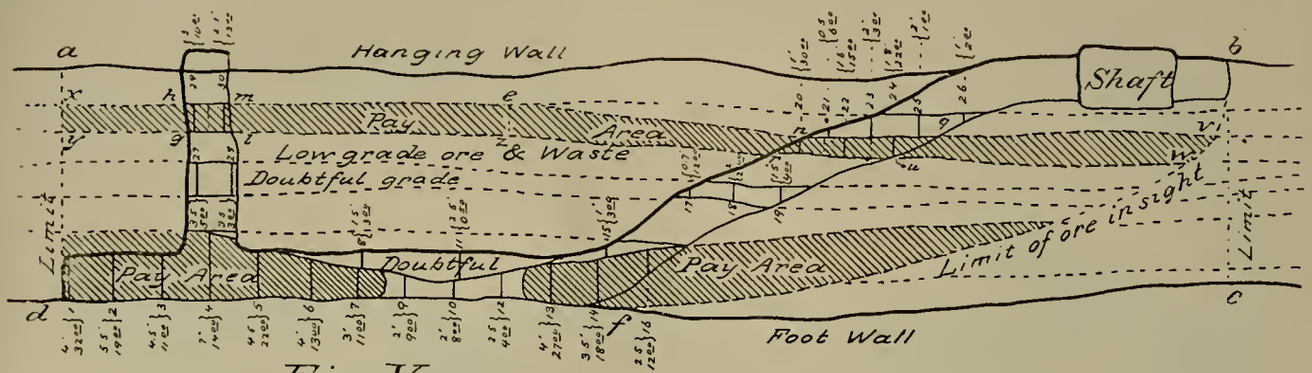


Fig. V

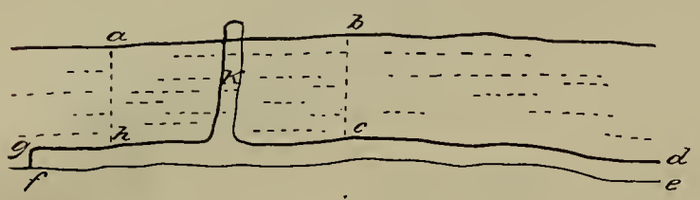


Fig. VI

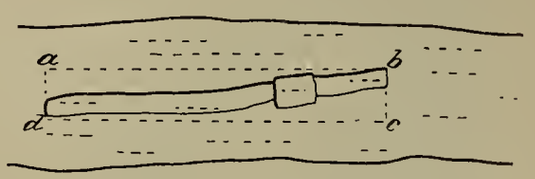


Fig. VII

Plate II

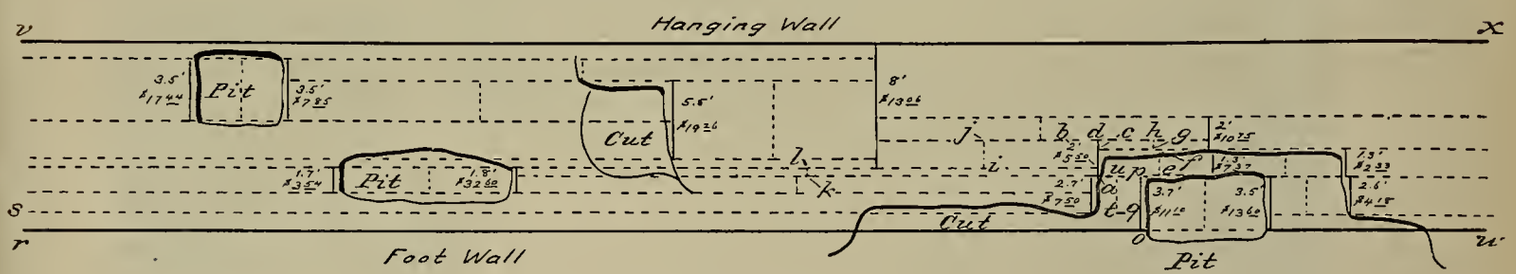


Fig. VIII



Fig. IX

Plate III

mate estimate of cost for each point. As this calculation is sometimes laborious the most convenient methods are illustrated by the following three special cases.

In all the sections the figures show the sample numbers and lines indicate the sample cuts. The length of each sample cut in feet or inches, and its assay value in dollars per ton are also given for each sample.

Taking the ordinary vein shown in Fig. I, it has been found that the ore in place measures 13 cubic feet per ton and the cost of stoping is $16 per fathom of 36 square feet. The sorting tests have shown that one ton of average ore broken yields 0.50 ton of shipping ore, and that this contains 75% of the total value which was in the original ton broken down.* It has also been estimated that the approximate cost of hoisting, sorting, shipping and smelting will be $12.00 per ton, figured upon the tonnage of ore broken. The following table is then calculated:

APPROXIMATE YIELD AND COST OF STOPING PER TON OF ORE BROKEN.

Thickness of the Pay Streak at the point considered.	Tons per Square Fathom of Ore Sheet	Cost of Stoping per ton.
A streak 4 inches thick yields.....	0.92	$17.33
" 6 " " "	1.38	11.55
" 8 " " "	1.85	8.67
" 10 " " "	2.31	6.93
" 12 " " "	2.77	5.78
" 14 " " "	3.23	4.95

Applying these figures to any doubtful sample point, such as No. 20, the following estimate is made:

Cost of stoping an 8-inch streak, per ton.....	$8 67	
Cost of hoisting, sorting, shipping and smelting, per ton of ore broken.....	12 00	
Total expense.....		$20 67
Value saved is 75% of the assay value of $19.00.....		$14 25

Thus demonstrating that the ore at this point will not pay to extract.

All pay points having been determined and marked, the pay areas which are to be included within the stopes are sketched. (See shaded portions of the figure.) These areas are then measured by scale, or calculated, and the length and average width of each one is also determined. †

In Fig. V the plane of an irregular drift and cross-cut presents a fair cross section of a wide vein whose structure is in parallel layers. Four of the ore streaks shown have been sampled, but only two of these have proven to be above the pay limit. They are so far apart as to require stoping separately, and are therefore treated as though each one was a distinct vein. The pay areas are fixed as in the previous case, and extended to the limit adopted for ore in sight.

Fig. II illustrates the application of this method to the section of an irregular body of milling ore. It is in this case a more simple matter to compare the the assay value of each sample with the total cost of mining and milling, plus the tailings loss, this sum being here taken as $5.00 per ton.

The pay areas outlined are carried only to the limit previously fixed for ore in sight.

In each section the value of its pay areas, either singly or jointly, is determined by averaging all the samples within these areas. In doing this, each sample is given a weight proportional to that part of the area which it represents.

When uniformly spaced, as in some parts of Fig. I, each sample value is multiplied by the length of its line and the sum of the products is divided by the sum of these lengths.

When irregularly distributed, it is necessary to sketch by judgment that portion of the pay area which may be allotted to each sample. In doing this, due regard is paid to the structure of the ore, whether homogeneous, in layers or otherwise. In every such portion the number of square feet is then measured and multiplied by the value of its sample. The sum of these products divided by the total area gives its average value.

In Fig. II the pay area $e f j m n l$ has been exposed for sampling only at two places, *A* and *C*. The average value of each part thus exposed, such as $e f d i$, is first determined by letting each sample represent the ore half way to that next adjoining. Sample No. 1, therefore, represents the portion $e f d$; No. 2 represents $e d g h$; and No. 3 represents $h g i$. The average value of part $m n l k$ is determined in the same way. The number of square feet in each of these two exposed parts is then multiplied by its average value thus determined, and the sum of both products divided by the sum of both areas. The result is taken as the average value of the unseen part $e i k l$. The part $d j f$ is assumed to have the same average value as $e f d i$.

In Fig. V a variation is made from the plan just described because of the layer-like structure and the distance between the exposed places. In the upper pay streak the average value determined as before at each of the two exposed places, $h m l g$ and $n q u r$, is assumed to extend half way through the unseen portion to the line $e z$.

Fig. VIII illustrates the use of this method for averaging samples in the section of probable ore exhibited by a vein outcrop. The samples were taken wherever the ore was uncovered, from scattered outcrops and shallow prospect pits. The structure of the vein was very regular, being in uniform layers, so that each sample was assumed to represent the layers cut by it for a distance half way to the next adjoining samples. For instance, the sample line $a d$ represents the area $a k l b + b i j d + c g h d + a e f e$.

It will be noticed that these fractional areas are not all represented with the same degree of probability, and sample $o p$, for instance, is more certain to correctly represent the area $p q t u$ than area $o r s q$. This is because the samples could not be uniformly distributed. If it happens for this reason that any areas are not well enough represented for the object in view, they should be excluded. In this case it was sufficient for the purpose to include all parts of the area within $w x v r$.

The same method is used for all special problems of this kind such as where samples are taken irregularly over a large open quarry of ore, or where a mass is pierced by scattered bore holes, or exposed by test pits. A case of the latter is shown in Fig. XIII, where the thickness and value of the ore sheet cut by each pit is given by figures. The outer line is the adopted limit within which the ore body is considered probable, and the dotted lines show the area allotted to each sample point. Each area is multiplied by the ore thickness to give the volume,



Fig. X

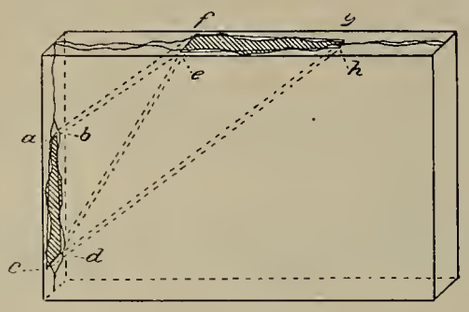


Fig. XI

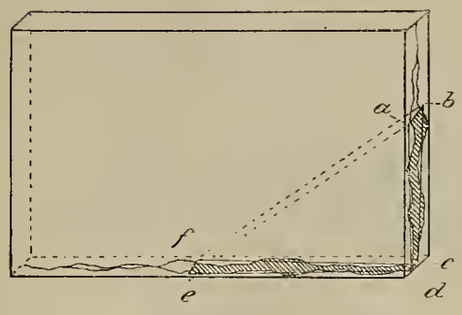


Fig. XII

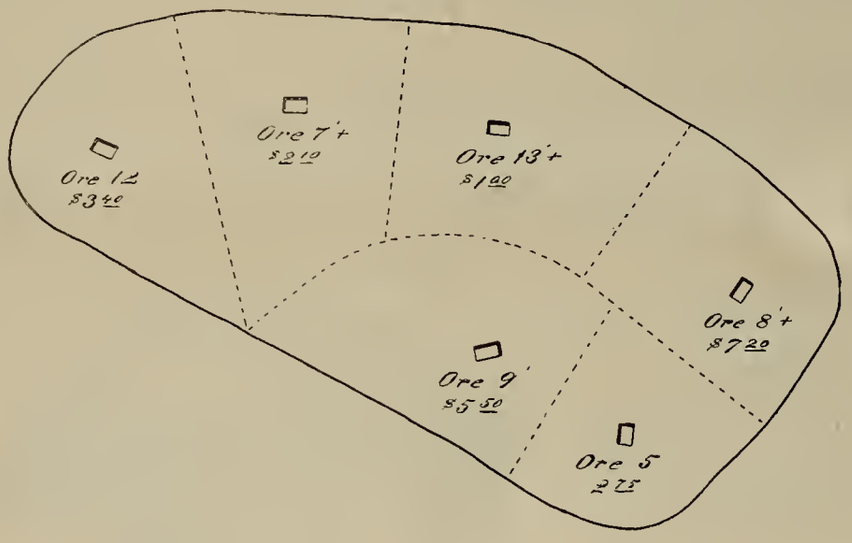


Fig. XIII

Plate IV

*While the results of sorting vary according to the grade of the ore, and are not the same for any two points in the pay streak, it is nevertheless accurate enough for this purpose to use the average figures.

†Of the well known methods for measuring such areas the following will generally be found most convenient and rapid for this purpose:

A small piece of thin transparent paper is ruled with parallel lines, 2, 5 or 10 feet apart by scale, as the case may require, and this is placed over the area to be measured. The length of the strips thus formed are then measured by a scale.

and this is multiplied by its sample value. The sum of the products is then divided by the sum of the volumes.

THE MEASUREMENT AND ASSAY VALUE OF VOLUMES.

The object of measurement is always to determine the *most probable* volume and value indicated by the sections for the unseen interior of a block. How closely these figures agree with the facts depends on the regularity of structure in the ore deposit and also on the proportion between the volume of ore in the block and the area of ore exposed in its sections. Blocks are frequently thrown into "ore probable" because the distance between the two opposite faces is too great for the small amount of ore exposed in them.

The judgment acquired by long experience in the structure of ore deposits is necessary to decide these questions so that the results will have the certainty required for "ore in sight." It is also necessary to judge how much these most probable figures may vary from the truth and apply the safeguards and the factor of safety hereafter mentioned.

The cases most frequently presented in practice are illustrated by Fig. IX, which is a section on the plane of an ordinary vein, whose thickness does not exceed the width of the mine workings. The pay areas determined in the various sections are indicated by heavy black lines.

Blocks with Two Parallel Sections.—This case is illustrated by Block *C*. It is treated as a prismoid whose end areas are constituted by the sums of the pay areas in each section. Unless one end area is very much smaller than the other, the use of the prismoidal formula is an unnecessary refinement. It is generally sufficient to average end areas and multiply by the perpendicular distance.

The average assay value per ton is obtained by multiplying the average value in each section by its total pay area and dividing the sum of these products by the sum of the areas.

Blocks with Three Sections.—Block *B* is of this class, having the sections $n\ k$, $i\ j$, $g\ h$. Two of these sections are often found to be more representative than the third. Its results are therefore sometimes omitted in whole or in part, and sometimes merely given less weight. When all the sections are used, the block is measured by the *Method of equivalent figures.*

Taking Block *B* as an illustration, the sections $g\ h$ and $i\ j$ each have one pay area, while section $n\ k$, which cuts two ore bodies, chances to expose three pay areas. The number of square feet, average value, actual length and average width, have been determined for each of the five areas. The purpose is to sketch within the block an average figure assumed of a certain uniform thickness, and of such shape that it will be the most probable equivalent of the pay ore included in the actual stopes.

The uniform thickness adopted for this purpose is the average thickness of the pay ore, which is found by adding the five pay areas and dividing by the sum of the five lengths. Each pay area is now divided by this uniform thickness, giving the length of an equivalent area, and these *assumed lengths* are plotted to scale in their average positions. (See lines $a\ b$, $w\ r$, $q\ s$, $t\ u$, $r\ x$.)

The equivalent figure shown by the shaded portions of the block is now sketched from these lines. In doing this due regard is given to the indicated structure, the object being to place the figure in the position probably occupied by the assemblage of pay portions. Assuming that in this block the main shoot evidently passes from $a\ b$ to $x\ q$, the figure is drawn symmetrically between them, allowing each area to represent conditions half way through the block. The area $w\ r$ thus appears to be a side projection, and the figure $w\ r\ z\ y$ is drawn from it to meet the main figure at the nearest point. The area of the entire figure is then measured by scale and multiplied by the uniform thickness. Block *G* illustrates a similar case.

Fig. X shows Block *B* when the structure indicates that one or more bodies extend between sections $i\ j$ and $k\ l$. This gives two equivalent figures $a\ b\ v\ x$ and $w\ r\ q\ s\ e\ t\ u$, or it may be treated as a combination of the simple cases under I and III.

In the method of equivalent figures, the average value is determined by multiplying the value of each pay area by that portion of the total volume which it represents. The sum of the products is then divided by the total volume.

Blocks With Two Perpendicular Sections.—In the simple case illustrated by Fig. XII the pay area in each section is converted to an equivalent trapezoid like $a\ b\ c\ d$, whose shape conforms as closely as possible to the average actual shape of the pay streak by having the same length and by being wider at one end than the other, if necessary. The ends $a\ b$ and $c\ d$ are parallel. The two trapezoids are sides of an irregular wedge to which the prismoidal formula is applied.

Fig. XI shows in perspective the case of Block *F*, Fig. IX. Here the areas are also converted to equivalent trapezoids and the figure cut into wedges by the intersecting plane $c\ d\ f\ e$. Blocks *A* and *H*, Fig. IX, also illustrate this case, the method of equivalent figures being used for Block *A*.

In wedge measurements the average value is calculated by multiplying the total pay area of each section by its value and dividing the sum of the products by the sum of the areas.

In irregular bodies blocks are usually found with two parallel sections, but at times peculiar and more difficult problems are presented. The section planes are occasionally at an acute angle to each other, and while the method of case III will generally apply, no rule can be given when each section shows several irregular pay areas. For such problems special expedients may always be devised. Masses cut by test pits or bore holes have their volume measured as explained by Fig. XIII.

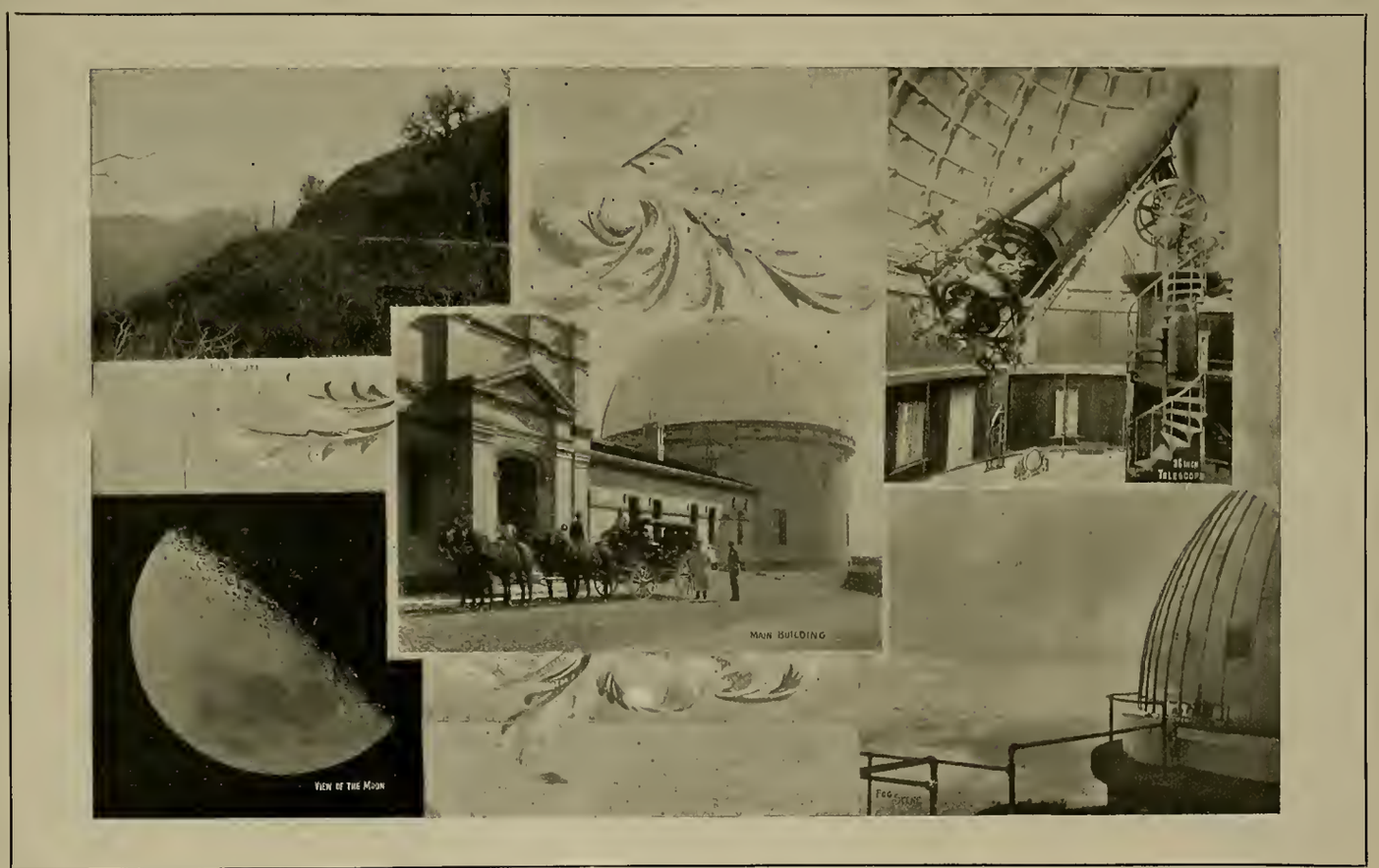
In practice blocks are often found with their contents partly stoped out, offering problems more complicated than the typical cases described. Additional planes of section are usually afforded by such stopes, and it is generally necessary to divide the block contents into several parts, each of which is measured separately. In such cases there is no difficulty in applying the principles already illustrated.

(*To be Continued.*)

The Lick Observatory.

Herewith we introduce a feature in illustration which for the moment, at least, lifts the thought away from the earth. And where should it go but to the stars, or beyond them? Ultra-stellar considerations are out of our field, consequently we stop at the boundaries of the vault of blue and depict California's greatest star work, the Lick Observatory, on Mount Hamilton, near San Jose. This institution is the Astronomical Department of the University of California, and was established by bequest of the late James Lick, whose estate yielded $700,000 for the creation of this great establishment for advanced research and higher education. At the time of its construction its telescope, with 36 inches breadth of object glass, was the greatest achievement of the lens makers and the most powerful instrument of its class in the world.

Californians have taken the greatest interest in



VIEWS OF THE LICK OBSERVATORY AND ITS ENVIRONMENT.

the Lick Observatory ever since the first announcement of Mr. Lick's provision for it, and that was twenty-two years ago, or thirteen years before the ponderous sky-piercer reached the mountain top in 1886. When the summit of Mt. Hamilton was chosen, because of its elevation and its large percentage of unobstructed atmosphere, Santa Clara county evinced a welcome for the establishment, and this took tangible form in an expenditure by the county of $80,000 in the construction of a fine roadway from San Jose to the summit which lies twenty-eight miles by road and eighteen miles in a direct line from the city. This road is almost as notable in its way as is the Observatory in its line of achievement. It is said by travelers to be the most beautiful mountain road in the world.

The photographs used in the engraving show a glimpse of the road, the chief elevation of the observatory and the great dome, the immense tube and fittings of the telescope and one of the views of the moon taken with the great lens. The work already done by the astronomers during the short life of the observatory is a rich warrant for the use which Mr. Lick chose for his money. It has greatly added to the sum of human knowledge and its career is only at its beginning. In the great stone pier which supports the telescope is the tomb of James Lick, and his mortal remains rest there most fittingly beneath this forceful agency for human advancement which he generously brought into being.

Scientific Progress.

New Treatment for Spent Oil Wells.

Wheu an oil well ceases to be productive the operator often explodes a quantity of nitro-glycerine at the bottom of the bore. The adjacent rock is thus shattered, and sometimes the flow is increased in consequence. An eutirely new method of treatment of such wells has been attempted recently near Lima, Ohio, by two men whose names are not given in the account at hand. This plan is to force a mixture of hydrochloric acid and water dowu the well and out into the crevices and crannies through which the oil might he expected to drain. Petroleum has, in this country at least, been found only in one particular kind of rock, a sort of limestone, upou which hydrochloric acid has a highly destructive effect. Under the corrosive action of the injected fluid the stone turns into carhonic acid gas and chloride of calcium, which latter is readily dissolved into water aud can be pumped out. The gas escapes spontaneously when the opportunity is afforded. In a well on the Crossley farm a pressure of 800 or 900 pounds too the square inch is said to have been resorted to in forcing the mixture into the rock. At first the amount which would enter was small, hut hy degrees the passages were enlarged and the quantity increased. The Ciucinnati *Enquirer*, which tells the story, says that sixty-five harrels of acid were used on the well in question. The hourly output just hefore the experiment had fallen off to three barrels, but this was increased to ten harrels immediately after the acid had been tried, and for forty days the supply has continued at that rate.

PROF. DEWAR says that oxygen is highly phosphorescent; that under certain conditions oxygen will give off a steady light. This is a suggestion as to the origin and nature of light. The proportion of oxygen increases nearer the earth's surface, and so does the iutensity of light. As we ascend in the atmosphere, light and the proportion of oxygen to other gases decrease in nearly the same ratio. The force which radiates from the sun in straight lines comes in contact with the oxygen of our atmosphere; and it is argued this combined action ignites the carbon gasses, producing light. This subject is not yet fully understood, hut investigators are pushing their work, and it may yet be demonstrated that light originates in our atmosphere and does not come from the sun; that force comes from the sun, and that force wakes light hy hurning the gases within our atmosphere.

A SIMPLE TEST for sewage contamination of water is to add four drops of permanganate of potash solution to a glass of the water. After standing two hours, the rose color imparted by the permangauate will have changed to a dull yellow if decomposing organic matter is present in a dangerous amount, and completely disappear in time if the decomposed organic matter is in very large quantity. If the proportion of impurity is small, the rose color may fade only slightiy. A good method of determining the quality of drinking water is to dissolve twelve grains of caustic potash and three grains of permanganate in au ounce of distilled water, and add one or two drops of this solution to a glass of the water. If a decided color is imparted, the water may be used, but it should be rejected as prohahly dangerous if the color immediately disappears.

A STRANGELY neglected fact of much importance has heen brought to notice by some recent experiments of Dr. Breslauer. It was found by Koch some fourteen years ago that the autiseptic properties credited "carbolized oil," or carholic acid in combination with olive oil, are lacking, yet the matter has received very little attention. Dr. Breslauer has now reported an exhaustive examination of various disinfectants, such as carholic acid, corrosive suhlimate, boric acid, nitrate of silver, etc., in combination with oil, vaseline, fat, lanolin anhydricum, lanolin, and unquentum leniens. The degree of antiseptic power proves to be remarkahly influenced by the diluent employed, and in all cases the hest antiseptic results were ohtained with disiufectants in comhination with lanolin or unquentum leniens. In experiments, for instance, with five per cent of carholic acid in various substances, it was found that the microhe of hoils survived immersion in carbolized oil for three days, in carholized vaseline one day, in fat four hours, in lanolin anhydricum two hours, in lanolin thirty minutes, and in unguentum leniens twenty minutes. Similar results were obtained with other bacteria and other disiufectants. It appears, therefore, that in ointments the disinfectant selected should be used in combination with lanolin or unquentum leniens instead of with oil, vaseline or other fats.

ACCORDING to investigations made hy Heinrich Mayr, there exists a very important law which will enahle a microscopist to tell at a glance the difference between heart wood and sap wood, only the former being fit, of course, for building purposes and to stand the influences of the weather, while sap wood rapidly decays, though often used hy unscrupulous builders. An examination of the resiuiferous ducts, says Mayr, will instantly show the difference. During the process of transition of the sap wood into heart wood, all these resiniferous ducts hecome closed hy the expansion of the cells surrounding them, a process which can he discerned unmistakahly even in the smallest piece of any wood from a conifer, a similar process taking place in the growth of the bark also.

EXPERTS in weather science have long wanted to ohtain indications of the temperature and pressure at an elevatiou of several miles. Professor Willis L. Moore, the new Chief of the United States Weather Bureau, has invented a machine for this purpose, which will be a comhination of kite and halloon, and make automatic records at an elevation of three miles, and telegraph them down to the earth, so that immediate use can he made of the figures for forecasting. Of course, the machine will he anchored, so that it cannot float away.

A STAR, says Sir Robert S. Bell, is a mass of matter heated to such an extent that its effulgence is perceived far and wide. But this heated condition is exceptional, and, though it douhtless lasts millions of years, the temperature must finally sink to that of space, where it will remain through all eternity, unless again kindled by some accident into temporary luminosity. The normal and ordinary state of all the matter of space is cold and non-luminous, and therefore invisible to us.

HELMHOLTZ has attributed cirrus clouds to air waves produced when one stratum of air glides over another of different temperature and density, the lower one being nearly saturated with aqueous vapor. The wave crests hecome centers of condensation, in consequence of diminished pressure, and appear as clouds, while the depressions form transparent interspaces. Ou this theory a "mackerel sky" is produced when two series of waves cross.

THE London *Mining Journal* says a gold medal or a premium of 150 florins is being offered by the Dutch Society of Science, at Haarlem, for a paper on the equilihrium phenomena of one or more alloys of two or three metals, ranging from the melting point of the metal most difficult to fuse to the lowest temperature at which the alloy will continue to remaiu in a liquid state.

MORTAR of brickdust and quicklime is now recommended as an excellent and durable substitute for hydraulic cement.

Mechanical Progress.

Unnecessary Refinement in Machine Work.

One of the most dangerous men in an engineering establishment that intends to make money is the fine mechanic who never knows where to stop putting on fine work. Such a man, left to himself, would scrape the bottom of an engine hed plate dead true, nickel-plate every casting and put a micrometer caliper on every piece in the engine. At the head of an establishment such a man would mean financial ruin. The difference hetween a husiness success and a business failure very often means knowing where to stop mechanical perfection. It ought to be an axiom in every establishment not to expend an unnecessary stroke on any piece of work. The fine work must stop short precisely at the point heyond which it is no longer needed. All this, of course, is easily said; hut when a man has the moral courage to have this done, and to so regulate an establishment that this is practically accomplished on every machine, he becomes simply invaluahle. Some of the hest business successes have heen made hy men who had the courage to put the finest of work, fair work and common work all on the same piece of machinery. To know when and where to apply fine workmanship, it is necessary not only to consider the machine in itself and its workings, but also to consider it as a merchantable article, subject to laws of trade, and to he treated as merchandise pure and simple. This way of looking at a machine is not only hest for the producer, hut for the buyer also. It may he a pleasure to the purchaser to know that every leg of his big press, for example, is interchangeahle and is fitted in place with scraped joints and polished bolts, hut no manufacturer could afford to put such work on to the machine at the market rate, and the purchaser again could not afford to use such a press if he had to pay what it would actually cost. In short, the finest work on machines should he expended only when it is needed. — Cassier's Magazine for November.

Making Tubing.

One of the most important parts of the hicycle, because the most in evidence, is the tubing. The manufacture of tuhing is now carried on to a large extent in this country, although it is but recently that the home production has reached a stage of perfection where it could successfully compete with that of the English concerns.

There are a number of methods of making tubing, but the one mostly in vogue at present is the cold-drawn process; it is of this style of tubing that all the high-grade machines are at present heing made. The machinery required is ponderous, and the power required to draw out a piece of steel without heating it is another exhibition of the perfection of modern machinery.

There are a number of variations to the method employed, one of which consists in taking a piece of steel in the shape of a har or ingot. This is bored through the center. It is then passed through a die, after which it is heated and treated to a hath in a secret preparation which removes the temper that the drawing process imparts. This is repeated a numher of times, and each die used is smaller than its predecessor, with the result that the tube grows smaller and longer. This is continued until the tube is the right diameter and gauge.

A MEANS of increasing the illuminating power of gas ahout fifteen times is claimed hy M. Denayrouze, a French physicist. A spherical metallic body and a mantle capahle of being raised to incandescence are included in the upper part of the lamp, and in the body is fixed a tiny motor, which works a ventilator and which receives current from a couple of small accumulators. The electrical energy required is said to be only one-third volt and one-tenth ampere, and this is sufficient to force air through the mantle and give the flame remarkahle hrilliancy. Lamps of 800 candle power have heen made.

A Big Dredge.

Linden W. Bates has completed at Cairo, Ill., the largest hydraulic suction dredge in the world, built for the government to be used in the work of improving the Mississippi river. Work was commenced on the contract in February and several hundred men were employed. It is designed to cut channels, and will wade through sand bars at the rate of ten feet advance every minute, cutting a swath sixty feet wide and six feet deep. This means that it will handle 3000 cuhic yards of material every hour. Its pumping capacity is 6,000,000 gallons of water an hour. Some idea of its size may be gained from the following tahle of weights and measurements:

Length of hull over all	172 feet
Width of hull	40 feet
Depth of hull amidship	7 feet 2 inches
Height of engine room	24 feet
Estimated weight of empty hull	310 tons
Estimated weight of machinery	800 tons
Estimated weight of fuel	90 tons
Total weight	1200 tons
Total engine power	3000 horse power

The immense power necessary to operate the great pumps is furnished by twin triple-expansion 1200-horse power engines with four cylinders, each capable of 200 revolutions a minute. Each pump has a 36-inch suction pipe which, with the ladders and machinery necessary to operate them, weigh ahout ninety tons. Engineers are interested in the test soon to he made.

AN interesting installation of gas engines—the first of the kind—has hecn made at Sunderland, England. Several Tangye engines have been coupled direct, without intervening helting or gearing, to centrifugal pumps for emptyiug a graving dock, and the results are said to have been thus far highly satisfactory. Each pump, of which there are several, can discharge hourly 2600 tons of water, and each engine indicates 120 horse power. They have a self-starting attachment.

AN ingenious method of welding lead has heen recently devised in France hy M. Blondel. The surfaces to be joined are carefully cleaned, and hetween them is placed a thin layer of lead amalgam. On passing an ordinary soldering iron along the line of junction the mercury of the amalgam is vaporized, and the lead, set free in an exceedingly finely-divided state, fuses and unites the two surfaces together.

THE casting of a mammoth church bell at the Buckeye Bell Foundry in Cincinnati, O., is completed. The bell is larger than the thirteen and a half ton bell at Montreal, up to this time the greatest on the continent. In ornamentation it surpasses all bells in existence, and is the largest swinging bell in the world. It will supplement a chime of forty bells in St. Frances de Sales church.

A STEAM PIPE capahle of resisting very high pressure has been patented hy a Glasgow engineer. It consists of a copper tuhe around which is wound steel wire, especial care being taken to insure perfect contact hetween the two metals. Soldering is effected hy immersing the whole in a fusible alloy whose melting point is ahove the temperature of the superheated steam.

A NEW smoke-consuming device for furnaces is an attachment automatically feeding a quantity of oil to the fire when fuel is added. As the oil hurns, it consumes the smoke, the injection of oil being adjusted at will to the amount of smoke expected at each fresh charge of fuel.

Two French experimenters have caused argon and helium to comhine with magnesium vapor under the prolonged action of the silent electric discharge. Argon is united with platinum under similar conditions.

Electrical Progress.

The Propagation of the Magnetism of Iron.

By W. PECKERT.

When a long straight iron bar is excited by a magnetizing coil situated at the center, the lines of force, all of which pass through the coil, do not keep in the iron up to its extreme end, but emerge into the air at all points along its length, so that the induction in the bar falls off continuously as the distance from the central source of magnetization is increased. With a periodically varying magnetizing force the same effect is produced, and, moreover, the corresponding periodic changes in the induction induce eddy currents in the iron. These cause a lag in the phase of the induction which increases as the end of the bar is approached.

Experimental proof of this was carried out on rods of about one meter length of wrought and cast iron, and on a large bundle of soft iron wires of 1 mm. diameter. The induction at various points was measured by search coils placed at intervals on the bar, and readings of the instantaneous values of the induction were taken through a complete period for each coil. The readings were obtained by means of a contact maker fixed on the alternating current dynamo used for exciting the magnetizing coil, the momentary currents being indicated by a Wiedemann galvanometer. Magnetomotive forces of 288 and 1306 ampere turns were used.

The curves of induced E. M. F. obtained from all three samples show a shift of phase which increases with the distance of the search coil from the center of the bar, both at the lower and at the higher values of the induction. The curves are not symmetrical with the zero axis, the difference being attributed to residual magnetism. There is no marked difference between the changes of phase produced in the solid and in the laminated specimens, the amount of shift not being sufficiently clearly defined to show any distinct difference. The magnitude of the deflections continuously falls off along the bar, showing the diminution in the induction.

Doubtful Electrical Projects.

The last article written by the late F. L. Pope, whose recent tragic death is fresh in the minds of electricians, in discussing a certain electrical project, says that all is not gold that glitters in electrical schemes, as in all others. People have now such faith in electricity that it is sometimes hard to persuade them that an electrical industrial application may possibly cost more than it is worth. The project in question involved the supplying of the manufacturers of a town with power from a distant lake. The circular of the project stated there is not the slightest question that the supply of water would be ample for the scheme as outlined, and that it is sufficient to furnish "at a very low estimate, 2000-horse power night and day during the entire year." Upon the basis that it costs $40 to produce a horse power by steam in the town, which is not an unreasonable figure, it is assumed that $80,000 worth of power a year can be delivered within a radius of ten miles of the town at an annual cost, inclusive of interest, depreciation and operating expenses, not to exceed $10,000. These figures, which are attractive enough on paper, will not bear critical investigation and for the benefit of those communities which may be contemplating the utilization of neighboring water powers, Mr. Pope made a concise and convincing analysis of the scheme. The proposed water supply has an area of 325 acres. The watershed does not exceed four square miles. The mean rainfall in that part of the country is about 37.5 inches per annum; in a dry year about 80 per cent of this, or 30 inches. Not more than 75 per cent of this finds its way into the lake; the rest remains in the porous soil, or is evaporated. This leaves 22.5 inches, or 1.87 feet, which, falling upon four square miles of watershed would yield, in round numbers, 198,500,000 cubic feet of water, equal to 337 cubic feet per minute. The 20-inch steel pipe which carries the water will give a head of 600 feet, which would give 409-horse power net. Assuming 80 per cent efficiency for the water wheel, 90 per cent for the electric generator and 90 per cent for the distributing system, there remains not 2000 but 262-horse power available for industrial purposes. Whether it is worth while to expend $50,000 or $60,000 to secure this amount of power is, according to Mr. Pope, "a question which should be best answered by those interested."

Electric Test for Jewels.

A correspondent writes to the *Electrical Engineer* as follows: "The other day a friend of mine, who is a jeweler, asked me jokingly whether I could rig up an electric shock producing device for testing diamonds and the detection of sham or paste diamonds. After thinking the matter over, I presented him, a couple of weeks later, with the following apparatus, to his entire satisfaction: To the spindle of a small electric motor is attached a small thin disc made of aluminum and placed in a horizontal position. A clamp with a small flat spring, and provided with an adjustable screw, holds fast a ring or any other article with the real or sham "brilliant." The ring, etc., is moistened, and slowly moved by hand toward the disc, driven at high speed by the motor, thus applying, so to speak, a break to the motion of the disc. The idea is based on the fact that if a sharp piece of aluminum be rubbed on moistened glass, brilliant metallic markings result on the glass diamonds but not on those which are genuine. If some metallic marks are found on the so-called diamond, then, of course, it is not a genuine article; otherwise, it is a real diamond of the first water."

UNDER date of October 18th, *Industries and Iron* (London) says: The extensive plans now debating for the establishment of railways in South Africa should arouse the keenest attention in the mother country. As is well known, a considerable portion of the South African gold-mining industry is represented by California miners, and in consequence of this and other circumstances, South Africa has come to be a quarter to which American engineering firms are prepared to devote both capital and enterprise in a large degree. We reported last week that the electric lighting of Buluwayo had been secured on behalf of the General Electric Company, which, contrary to the suppositions expressed by some of the American organs, appears to be employed with other things besides placing its stock with misguided investors. For plant of the proper type there is a huge market just opening in this developing country; but without personal acquaintance being made by proper representatives with local requirements, it is almost idle to attempt to compete with those who have made it their business to accurately gauge the exceptional exigencies which are imposed by the characteristics of the country.

EMILE BERLINER, in a recent interview, said: "The next step in the development of the telephone will enable a number of persons to talk over the same wire simultaneously, and by this means the cost of long-distance telephoning will be much reduced. Experts are working on this problem now. The Bell company spends $100,000 a year for experiments. In the Boston laboratory thirty experts are constantly engaged in working on telephone problems. An invention that is even now approaching perfection is the theatrophone. This contrivance will make it possible for people to step into a public office and listen to grand opera, comic opera, or the songs and funny dialogues of a variety show."

Practical Information.

Metals and Minerals.

Professor Skidmore of Philadelphia, in a course of laboratory lessons to supervising principals and teachers of the Philadelphia public schools, took up the subject of metals recently. In the course of his lecture he made some interesting remarks in regard to the distinction between minerals and metals. It is not possible, he observed, to define exactly what a metal is, yet there is little liability of mistake in distinguishing a metal from a nonmetal. The metallic properties of luster, toughness, fusibility, opaqueness, conductivity and rust may be possessed separately by nonmetals, but they are not associated as they are with metals. Most metals may be bent, twisted, drawn and hammered to an extent far beyond what any mineral not a metal could endure.

Taking up the matter of the rusts of different metals, he showed by a series of interesting experiments that sodium, potassium, lithium and, in a lesser degree, calcium, strontium and barium rust instantly when exposed to moist air, their white rusts quickly dissolving in water and forming alkalies. Other experiments demonstrated the fact that another group of metals, in which are zinc, lead, magnesium and antimony, have white rusts which are not soluble in water. These rusts form a thin adherent coating, which only half conceals the metal and gives to it a dull, tarnished appearance. It was shown that at higher temperatures than the ordinary, and especially if the metals are finely divided, the chemical energy of rusting is so great that the metals burn with a vivid light and emit a dense white smoke. The permanency of these rusts and their protective character are utilized in white paints.

Professor Skidmore then directed attention to a third group of metals, which includes those which have dark or colored rusts, as with copper, iron and silver. A series of experiments followed to show how these rusts were formed, and the changes which iron undergoes in appearance in the tempering process were carefully noted. Attention was directed, finally, to the fourth group of metals, which never rust. These are gold and platinum, and it was noted that they are also the metals which are found as metals in the earth, and not as ores from which the metal must be manufactured. In the case of the other metals it is an advantage that they are found in the rust or ore condition, as they can be manufactured much more easily than they could be cut from ledges of the pure metal.

A Convenient Rule.

IT will be interesting, says the *Iron Trade*, to those who have anything to do with sheet iron, boiler plate or similar material to have an easily remembered rule for finding the weight per square foot of material they are working with. The fact that a square foot of iron plate one-eighth of an inch thick weighs almost exactly five pounds, forms at once a basis for a very simple and easy rule. As a square foot of iron one-eighth of an inch thick weighs five pounds, a square foot of one-fourth inch iron will weigh ten pounds, and we can say that the area of any sheet iron, or iron plate, in square feet, multiplied by the thickness in one-eighths and multiplied by five, will give the weight of the piece. There is a piece of tank iron five-sixteenths of an inch thick, three feet wide and five feet long; how much does it weigh? The area will be three feet by five feet, or fifteen square feet. Now, how many eighths in five-sixteenths of an inch? Since one-eighth of an inch equals two-sixteenths of an inch, and two is contained in five two and a half times, we say five-sixteenths of an inch equals two and one-half eighths, or two and one-half times five pounds equals twelve and one-half pounds per square foot; and as there are fifteen square feet, we have fifteen feet by twelve and one-half feet, which equals 187.5 feet. Where the thickness is even eighths of one inch, it is much simpler, but even this is not a hard thing to do, as shown. If it is desired to use this rule for other than iron, we simply find the difference between the weights of the two metals per cubic inch and find what a square foot one-eighth of an inch thick will weigh, then work as shown above.

Value of Carcass of a Dead Horse.

The horse carcass is of more present value for its chemical products than the living animal. The carcass is first relieved of its hair by a shaving process. The tail and mane are especially valuable; from these is made haircloth. The short hair taken from the hide is used for stuffing cushions and horse collars.

The hide is valuable; the leather known as cordovan is made from the skin over the rump and used in the manufacture of high-class hunting and wading boots, as it can be made impervious to water. The other leather is soft and is used mostly for slippers and heavy driving gloves. The hoofs are boiled to extract the oil; the horny substance is shipped to the manufactories of combs and what are known as Mikado goods.

The carcass is cooked by steam at a pressure of three atmospheres. This separates the flesh from the bones. The leg bones are very hard and white, and are used for handles of pocket and table cutlery. The ribs and head are burned to make bone-black after they have been treated for the glue that is in them. In the calcining of these bones the vapors arising are condensed and form the chief source of carbonate of ammonia, which constitutes the base of nearly all ammoniacal salts. There is an animal oil yielded in the cooking process which is a deadly poison and enters into the composition of many insecticides and vermifuges.

The bones to make glue are dissolved in muriatic acid, dissolved in boiling water, cast into squares and dried on nets. The phosphate of lime, acted upon by sulphuric acid and calcined with carbon, produces phosphorus for lucifer matches. The remaining flesh is distilled to obtain carbonate of ammonia. The resulting mass is pounded up with potash and then mixed with old nails and iron of every description. The whole is calcined and yields yellow crystals of prussiate of potash, with which tissues are dyed a Prussian blue and iron transformed into steel. It also forms cyanide of potassium and prussic acid.

Suggestion for Clear Cistern Water.

TO THE EDITOR:—Having noticed an inquiry on how to filter rain water into a cistern to take the smoky taste out of it and make it good drinking water, I would suggest having a cut-off in the pipe leading to the cistern and be sure to have this cut-off open to carry away all soot or dust that may accumulate on the roof before each rain. When the roof is washed off well, turn the cut-off on to the cistern.

In the cistern build a filter of brick, in the shape of half a pear, building it against the side of the cistern. This filter should be built of bright red brick, laid flatways in good lime mortar. The outside and inside of the brick should be kept clear of mortar. Build in a half circle, about two feet wide at the center of the circle and close in at the top about three feet high. Place the pump pipe down through the wall of the filter to about one and one-half or two inches from the bottom, and close the pipe tight in the hole and the water will go through the four inches of brick faster than it can be pumped out. I know of no better way to purify water than to pass it through four inches of brick. If any dirt is in the water, it is left on the outside of the filter.

A. C. THOMSON.

Duarte, Los Angeles Co.

Mining Summary.

CALIFORNIA.

Amador.

THE FOGUS.—*Ledger:* The original owners of the Fogus mine in Volcano district sold it to Lyle and others who organized the Fogus Mining Company of California. They defaulted on their taxes, and H. D. Emerson bought the property in, and later sold it to Wolf & Camphell. These people put up a mill and now have several liens and attachments ou the property resulting from their failure to pay for timher and material. Lately the Fogus Gold Mining Company of Nevada was organized, and the interest of the California Fogus Company transferred to them. As successors in interest of the Fogus Company of California, they commenced suit in the United States Court for possession of the property. The result of the suit has been the selling of the interests held hy Wolf & Camphell to the Fogus Company of Nevada, which by the way, carries with it the dismissal of the suits in the United States Court.

ONE THOUSAND FEET DEEP.—*Dispatch:* The shaft at the Argonaut mine has now nearly reached the 1000 foot level, and the work is still progressing vigorously, with flattering prospects ahead.

Butte.

THE GOLDEN SUMMIT MINE.—This mine is 6309 feet ahove sea level. Snow last winter fell to the depth of 32 feet. The main shaft is down 200 feet. On the first level there is a tunnel running east 300 feet and one west 450 feet. On the second level the side stopes are 180 feet. The tramway, walk to hoarding house and hoist are all protected with strong snow sheds. For nearly three months last winter the light of day did not penetrate the hoarding house and candles were hurned both day and night. The land comprises 320 acres of patented land and 320 acres covered by location. Forty-five men work in the mill and mine and ahout 20 more are cutting and hauling wood. The company is getting in 3000 cords of wood for winter. The mill contains 10 stamps. Two engines are run, one at the mill and the other at the hoist. Water is supplied from three ravines and it is carried from two tower houses in iron pipes to the works. C. G. Kane is superintendent and has charge of the underground work. It is thought that within a few months the mill will have 20 stamps additional.

GOLDEN FEATHER. — The following cablegram was recently received by the London owners from the company's general manager at Oroville.—"Reached hottom gravels ahout Septemher 29; prospecting very good; ground rapidly changed into rock-filled gorge. Got through this on Octoher 9. Now have good prospects immediately ahead. Clean-up will amount to ahout $4000 in working ahove-mentioned very bad ground."

Calaveras.

AT CARSON HILL.—*Voice:* It is said that the Melones mine at Carson Hill will start up soon. It is owned hy James W. Grayson of Oakland.

At the Iron Rock mine at Carson Hill, bonded by G. W. McNear, the tunnel has heen run in 165 feet, and they are now crosscutting the vein.

The Carson mine, formerly the South Carolina, has gone about 120 feet on its 150 foot tunnel. Martin of the Rawhide, who is doing the work, is running three eight-hour shifts night and day.

MINE BONDED. — *Chronicle:* The Mineral King silver mine, twelve miles from West Point, has heen placed on the London market, and a sale is now pending; $100,000 is the price asked.

PEEK RANCH MINE. — Work on the Peek Ranch mine is progressing steadily. The gravel encountered is of a hard cementy nature, and powder has to he used in breaking it up so that it will wash. One hundred and fifty inches of water is at present being used.

GENERAL NOTES.—*Echo*: Gilman & Mercer are finding good ore in their mine at Smith's Flat.

The erection of the addition to the mill at the Gold Hill mine is now under way.

The work of opening up the Bovee mine continues, and in a short time everything will he in readiness for stoping.

James G. Maltman is engaged in reopening the Lightner mine in this town. Several men are now at work on the property.

The Utica Co.'s chlorine works are running to their full capacity day and night roasting sulphurets from the company's numerous mines.

The Utica Company's mines—the Utica, the Stickles, the Madison and the Gold Cliff—are all running in first-class shape and yielding big dividends.

Work is progressing at the Pure Quill mine, and everything ahout the place is heing put in shape preparatory to the heginning of operations for the winter.

There is a prospect of the Calaveras Consolidated mine at Rohinson's Ferry starting up before long. Mr. E. K. Stevenot has the property under his control at present.

The huilding of the new mill on the Tulloch mine at Alhany Flat is going on briskly. There are 700 tons of ore now on the dump that will he put through the mill as soon as it is completed. Work is going on in the mine day and night.

Inyo.

ONLY A RUMOR.—*Register:* It is reported that a forty-stamp mill will he huilt at Copper Mountain ahove Mono Lake. It is understood that the owners are negotiating with an Inyo mill owner for 200,000 feet of lumher.

OPERATIONS AT MAMMOTH. — At Mammoth, the mill started last week. The ditch has een completed from Lake Mary. and everything is now ready to run. The tramway is ahout a third completed.

Lassen.

ACTIVITY AT HAYDEN HILL.—Beiber *Gazette:* That there is considerahle activity on Hayden Hill is evident from the numher of mines which are now heing worked there. The list embraces the following claims: Golden Eagle, Evening Star, Brush Hill, Mount Hope, Hayseed, Blue Bell, Big Tunnel, and the resuming of work in the Juniper mine is also in contemplation.

Los Angeles.

THE BIG HORN. — *Times:* F. V. Layton, until recently general manager of a large St. Louis syndicate with a paid-up capital at $3,-000,000, operating a large silver mine in Sonora, Mexico, is now manager of the Big Horu Gold Mining Company of this city. It is capitalized for $2,000,000 and owned hy Senator S. M. White, Judge E. M. Ross, L. W. Blinn, J. A. Graves and a few others, all of Los Angeles. He is here gathering good and experienced miners to take up to the Big Horn, as Mr. Layton is doubling the force and pushing the work as fast as possihle on the mine, as well as pushing the construction of a road to the mine. The mine is developed to a depth of 300 feet and has heen crosscut in several places for a distance of some 1200 feet in length, showing a hody of gold ore of over fifty feet in width hetween walls, containing two million tons valued an over $8,000,000. November 1, 1896, will see a mill of one hundred stamps, capahle of crushing 300 tons per day, in full blast on the mine and giving employment to over 250 men, who will all look to Los Angeles for a market. The mill and other machinery will he run hy waterpower, as there is over 600 horse-power to he had within one mile of the mine.

Madera.

AT COARSE GOLD.—*Mercury*: R. Taylor and W. A. Phipps of San Jose have purchased the Santa Rosa mine, owned hy Francis Pero, at Coarse Gold. Mr. Taylor was formerly foreman of the Zehra mine and at one time worked the Santa Rosa mine. There are fourteen tons of ore on the dump, which assayed $35 to the ton. Some of the ore assayed as much as $1000 to the ton. They intend to put in a ten-stamp mill.

Mariposa.

THE HITE MINE.—The Hite mine is now free of water, the shaft is heing sunk deeper and the mill will soon he running.

Mendocino.

A COPPER PROCESS.—Of the W. P. Thomas copper location, near Round Valley, F. C. Mathyas, field assistant to the State Mineralogist, says: "The samples of sulphide ore I have examined from the W. P. Thomas location are excellent, and could he profitably worked at very little expense hy the lixiviation process, now heing used to great advantage in the Campo Seco mine in Calaveras county. By this process it is necessary to pile the ores in piles of 100x100 feet square. When ignited, the sulphur in the rock keeps up the fire, the halance heing converted into sulphate of copper. When the fire has died out water is thrown on. It percolates through and dissolves the bluestone, which is drained off in wooden troughs. Scrap iron or scrap tin is then thrown in and that deposits the copper in a metallic state. In this form the metal is called copper cement, and is either sold as paint or else melted in crucihles and converted into pigs."

Nevada.

IT PAID WELL.—*Union:* Nearly three tons of ore from the Federal Loan mine were sent to the Selhy Smelting Works at Sau Francisco and the returns are very gratifying, the ore yielding nearly $200 per ton ahove all expenses. This is indeed encouraging and proves that the Federal Loan will he a great mine some day. The work of drifting is now heing pursued.

DRIFTS AND CROSSCUTS.—*Telegraph:* It has long been thought that the Empire mine had more length of drifts and crosscuts than any other mine in the district. It is not so, however. The North Star mine has fully twelve miles of drifts and crosscuts underneath its surface and a gentleman to-day informed us that he believed an accurate measurement would show up fifteen miles of such. There are certainly twelve miles.

THE MOUNTAINEER.—Superintendent Dennis has pumped out ahout a mile of levels and drifts in the Mountaineer mine at Nevada City, says the *Herald*, and cannot see bottom yet. There is an immense quantity of water there.

Placer.

THE GRAY EAGLE MINE.—*Republican:* The Gray Eagle mine, of the Forest Hill Divide, is proving richer than the most sanguine expectations of its owners. The gravel runs as high as $400 per car and there is a prospect of its continuing throughout the channel at this high figure.

San Bernardino.

A NEW DISTRICT.—A. J. Hellerman who has heen prospecting throughout southern California, Arizona and southern Nevada has made several locations in a district twenty-five miles northeast from the Desert Queen. The White Star and the Ivanhoe are the two locations in which he has most confidence. On the former he has a shaft 100 feet in depth, and drifted on the ledge forty-five feet. The free milling ore yields an average of $35 a ton.

On the Ivanhoe a shaft has heen sunk sixty feet, from which drifts have heen run about thirty feet in either direction. The ledge is wider than the White Star—about thirty inches—and is free milling ore, averaging so far as tested $48.50 a ton.

Plumas.

MORNING STAR MINE. — *National-Bulletin:* E. C. Rohinson at Granite Basin, on the Morning Star quartz mine, has a shaft seventy feet on the wall of the ledge. It is the intention to sink the shaft fifty feet farther. In free gold, the quartz mills from $6 to $7 per ton. On an average, it contains five per cent of sulphurets, some running as high as sixty per cent; the ore assays from $24.70 to $803.41 and the sulphurets $1778 per ton. To save the gold, he will put in a two ton plant chlorination works next spring.

DIAMOND MOUNTAIN.—The 10-stamp mill at the Lone Pine mine will start up next week.

NELSON CREEK.—*National-Bulletin*: Fish & Co. have put in nearly a thousand feet of six-foot flume. This season they will run a large tract to top tailings down to flume and work a large portion of the creek hed.

San Diego.

JULIAN DISTRICT.

THE ELEBADA.—The owners of the Elehada are working two shifts. The main shaft is down 110 feet. Levels in hoth directions have heen run part way down the shaft and also at the hottom aggregating 180 feet. A hlock twenty feet square was recently stoped out which yielded 100 tons of milling ore.

TO PROSPECT ON THE DESERT.—*Times-Index:* There are more prospectors going out on the desert at the present time than during any corresponding period of previous years. Gold Rock mining camp (Hedges postoffice), and neighboring localities are enjoying quite a boom. Prospectors are purchasing tickets to all points along the railroad between Banning and Yuma.

IN THE GAVILAN COUNTRY. — *Union:* The English company working on the San Jacinto grant in the Gavilan country, who have been prospecting and crosscutting the country thereabouts for several months past, have discovered a number of fine ledges, and on some of them sinking has been commenced. Much of the ore is rich in character, some of it running into the huudreds per ton. This is being sacked and put in houses built for the purpose. The company is composed of a number of rich Englishmen, and it is their intention to develop their estate to the amount of $100,000 before any machinery is put up. When they are satisfied that they have some good mines, they will put in a larger plant than there is in southern California.

Shasta.

HARRISON GULCH.—The Anderson *News* says that Harrison gulch, in western Shasta, is a lively camp, over 100 men being at work there. Lee Powers is putting up a hoarding house, and his sawmill at Wildwood is running day and night to supply lumber for the camp. When the Hay Fork road is completed the new mines will make trade for Anderson. Fowler and Conant are opening some promising mining property there.

MAY RESULT FAVORABLY.—*Democrat*: Rumors are afloat that negotiations are afoot for the purchase of the Stowell group of claims, north of Iron Mountain, and considered hy mining men to be as extensive a property as Iron Mountain. J. T. Hill of Redding, acting for a rich New York company, recently inspected the property and wired a report to headquarters. The mine is an immense one, and will he sold wheu Stowell gets his set price in his hand.

Trinity.

Journal: The Altoona mine at Cinnabar is steadily producing quicksilver, from twenty to twenty-five flasks being the daily output. There are many men employed now but during the winter the force will he reduced. The camp presents a prosperous appearance. General merchandise stores have heen started with stocks of goods needed for the men. A new shaft has been sunk from the present level for sixty-five feet, and the ore is holding its own well; this shaft will he continued 210 feet below the lowest level, which will give a depth of 430 feet. A new furnace will prohably he added in the spring.

NEW RIVER.—*Journal:* Hennessy, Clecker & Crane, who have the R. L. Thomas placer claim leased, are working hy means of a reservoir, which fills only four times a day, making only a run of one and one-third hours. Working to such great disadvantage they cleaned up over $225 after a month's run.

The Hohoken and Granite Slide Mining Company, incorporated, are making preparations for winter, when they expect to work twelve men. They have already expended $7000 on improvements. To make an opening to their hack channel they had to cut a rim of hedrock over forty feet deep and ahout 150 feet long. They have over 12,000 feet of sixteen-inch pipe laid ready for operations, in connection with which they have huilt a reservoir.

W. J. Nichols, owner of the Mason Bar claim, is anxiously waiting for water. He only runs about one hundred days in the year, and although having a very heavy bank to work he never realizes less than from $6 to $10 a day. He has about 1,500 feet of fourteen-inch pipe.

Tuolumne.

A MINE BONDED.—*Leader*: D. B. Warfield has honded his mine in Tuolumne county to W. M. Ferguson, of LaGrange, for a period of one year. Mr. Ferguson, assisted hy San Francisco parties, will put up a mill and proceed to developing the property at once. The mine at one time was a highly paying property hut fire came and swept away a twenty-stamp mill and all accessory huildings hesides four or five other mills in the vicinity. Work was at that time shut down. When Mr. Warfield left Tuolumne county for Oakdale he patented it and the mine has since laid idle. It is situated ten miles southeast of Sonora near the Eureka Consolidated owned hy Hayward & Hobart.

NEVADA.

DISTANCE LENDS ENCHANTMENT. — Miners are leaving Tuscarora in parties hound for DeLamar, Nev., which causes the *Times-Re view* to remark: "We are pleased to see all those who, heing idle, manifest a desire to better their condition, hut it is a conundrum to us why they should jump at a bare possihility of prospecting three or four hundred miles from here while there is plenty of that kind of work to he done at home. Our camp is not half prospected. Verily, distance lends enchantment to the view.

A GOOD PROSPECT.—The Gertie mine owners in Cory district, Esmeralda county, have what may prove a valuable mine. Three men have taken out and sacked twenty-five tons of ore. It is estimated that the ore will mill $75 per ton.

THE CANDELARIA MINES.—Affairs at Candelaria are progressing satisfactorily, and the mines under the management of Colonel W. J. Sutherland will soon again he in active operation. The new plant now heing erected under the Peck patents, for working tailings and low grade ores, will soon be completed, and the English company will he ahle to go ahead on a profitahle hasis, regardless of even still lower prices iu the silver market. Captain Hulse of London, one of the prominent stockholders in the Candelaria companies, is at the mine.

OREGON.

ONE MORE "PROCESS."—N. D. Clarke, of Irma, Curry county, has invented a gold-saving machine and will apply for a patent. He says it will he simple and of unlimited capacity. There will he no mysteries or secret chemicals, hut a practical application of natural laws.

Josephine County.

A PLACER MINE.—W. H. Hampton has a hydraulic mine at Placer, Josephine county, 13 miles north of Grant's Pass, where he has two ditches completed, with an aggregate length of 20 miles, to hring water from Grave creek. The ditches are seven feet wide at the top, four at the bottom, with a depth of three feet. Operations will he carried on through the winter. The company has about 300 acres to work.

UPPER CHETCO MINES.—Chris Russ is one of the locators of the Mayhelle Mining Co.'s group of placer mines on the upper Chetco river, recently incorporated with capital stock of $100,000. The Del Norte *Record* says that this group of placers, according to the report of an expert sent hy Senator Jones to inspect them, is a rich placer. The same claims were located several years ago, hut nothing was done towards their development.

WASHINGTON.

A great deal of work is heing done at the San Poel placer mines on the Columbia, north of Wilhur. The Wilbur *Register* says: Most of the plants are now running day and night shifts, especially to keep the water running over the sluices so that freezing will not interfere with the work. It is expected, if the weather continues fair, that nearly all the work in progress will continue through November.

THE CLEVELAND MINE. — Ten men at the Cleveland mine, in Stevens county, are producing about a ton of 100-ounce ore per day from a ten-foot ledge of silver-lead ore. Some black sulphurets have recently been encountered in the workings. The shaft on the property is 60 feet deep; the best ore comes from nearer the surface.

TIN ORE IN KITSAP COUNTY.—A few months ago there was a report that tin ore similar to that found in Cornwall, England, had been discovered in Kitsap county, thirty miles from Seattle, which ran from three to five per cent in tin. A company was formed with a capital of $2,000,000, called the Cook Kitchell Mining Company. Carl Kleinshmidt, in a report on the property, says: "By rigid and strict economy in all the details the mines may he made productive and self-sustaining, if the superintendent has practical as well as theoretical knowledge of tin mining and reduction." The property consists of twenty-six claims, aggregating 520 acres.

THE OKANOGAN COUNTRY. — *Outlook*: An "iron capping" craze has struck this country, where there is an extensive mineral helt in which iron capping is a characteristic feature of the ledges. This capping, so far as it has been tested, carries hut very little gold, generally assaying from a trace to $5 a ton. On account of their heing so low grade, hut little attention has heretofore heen given to the district and there is not to exceed a ten-foot hole on any of these iron caps. However, since the Tral Creek country, with the same distinctive characteristics, has come into such prominence, our prospectors are heginning to investigate. Those who have heen over the ground are firmly convinced that the mineral helt which is producing such marvelously rich mines at Trail Creek is the same that is found cropping out so prominently in the Sooyoos district. It does not follow, that hecause the Trail Creek mines are rich or carry mineral in paying quantities, the Sooyoos district, in the same mineral zone and possessing similar features of formation and distinct likeness of common characteristics, will also possess the precious metals in equal quantities.

BRITISH COLUMBIA.

A BIG MACHINE.—Since April last there has been in course of construction in Vancouver, B. C., a large mining machine for the B. C. Gold Dredging Company, under the direction of W. A. Shahan, superintendent of the company. The plant is located on a scow 30x100 feet. The cost complete will he about $30,000. Mr. Shahan says the principle on which it is to he worked involves the use of a suction pump and vacuum chambers. Boulders up to twelve inches in diameter will come up through the pipe, but everything down to three inches in diameter will he screened out from the chambers back into the river again. Then, by the use of a suction pump, all the remaining material is carried up on to the grizzly hars, and everything down to pieces

one-quarter of an inch in diameter is then removed and sent down to the river. The residue passes on to the sluice way. The material delivered by the grizzlies passes over a revolving cylinder on an endless apron. Beneath this apron in a water-tight box there are magnets set all the way from where the material will first drop on the apron to a point below where the water and gold sand will naturally flow off. By this means the black sand will be allowed to drop below, where an automatic carrier will pick it up and tote it along to a sack. When a sack is full its weight will cause a bell to ring and the attendant will remove it and put another sack on the rack. The grizzlies will discharge on both sides of the scow, so that there will be two sets of sluice boxes and two of the electro-magnetic black sand catchers. The plant has a capacity of 3500 cubic yards every twenty-four hours. The main driving engine is a steeple compound with a driving capacity of 150 I. H. P. The scow is fitted with wrapping gear, steam windlasses and capstan. It has an electric plant, so that work can be carried on at night as well as by day. A crew of twelve men is sufficient for a 24-hour shift. W. A. Shahan is superintendent of the company, J. E. W. McFarland president, and J. W. Campion secretary. The shareholders of the company recognize their scheme partakes of the nature of a gamble but they think that the odds are on their side.

THE SKY LINE.—Scott McDonald, manager of the Sky Line, at Ainsworth, B. C., is authority for the statement that they had struck twelve feet of ore in the mine which runs 400 ounces in silver. They are now shipping thirteen tons a day to the Pilot Bay smelter. Work will continue at the Pilot Bay smelter all winter.

BONDED TWO MINES.—Marcus Daly, the copper king of Montana, has bonded the Winnipeg mine in Wellington camp for $50,000, and the Calumet for $25,000, five per cent down, and put a force of men at work building a wagon road and erecting buildings. The bonds are not to be redeemed for a year, and the provisions require that the prospects he worked continuously until that time, or the contract is forfeited by the purchaser.

TRAIL CREEK. — *Miner:* The first carload of ore from the Evening Star averages about $50 in gold.

The second payment of $6,000 has been made on the Robt. E. Lee and Maid of Erin claims, the recipients being William Dunn and Michael Sullivan. These claims were discovered last fall and are now bonded for $60,000. A steam hoist, pump and power drills will be put in.

On Wednesday last $40,000 cash was paid on the purchase of the option taken by Messrs. Mason, Hoge and McKinney a month ago for the Trail Mining Company. This secures for the camp a very strong mining company, and ample machinery will be brought in for the company's properties.

THE HORSEFLY HYDRAULIC MINE.—At the Horsefly mine, in charge of J. B. Hobson, formerly of Placer Co., the running expenses are $7,000 a month. Local journals say the mine will pay about $150,000 a year.

ALASKA.

SILVER BOW BASIN.—*Record:* The Juneau Mining and Milling Company has closed down operations for the season, but as early as possible in the spring will start up again and during the summer will greatly increase their capacity for future work.

IDAHO.

RUNNING REGULARLY.—*Avalanche:* Regular shipments of bullion and concentrates are being made from the Trade Dollar and Black Jack mines. The Poorman is also running steadily and profitably.

TWO DAYS' RUN. — Statesman Amos Lee yesterday brought to the city 153 ounces of gold, the result of ten days' run in a five-stamp mill on ore from the Hidden Treasure mine in Neal district.

HIGH VALUE GOLD. — Elmore *Bulletin:* Henry and Charles Meegan were here Monday from their placer diggings on the Snake, after supplies. Under a strata of hard-pan they have found on their claims a layer of gravel remarkably rich in gold that is worth over $19 per ounce.

BOUGHT THE WHOLE PROPERTY.—Wood River *News-Miner:* The deed of E. Tootle and M. A. Reed of Buchanan county, Mo., conveying to the Fortuna Mining Company, a corporation under the laws of New Jersey, the Big Camas No. 2 mine, mill, millsites, the townsite of Doniphan, etc., for a consideration of $212,500 has been filed for record.

BUNKER HILL AND SULLIVAN. — Manager Bradley reports that on October 31st there were 368 men employed at the mine and 48 in and around the concentrator and crusher, the latter being situated near the mine, where the ore receives a preliminary crushing before being sent over the tramway to the concentrator, or 416 men in all. The payroll for thirty days in October amounted to $38,000, and for thirty days in October the average amount of ore mined was 500 tons per day. One day the output was 638 tons. The miners are paid $3, the shovellers $2.50 per day. He says: "There is a common impression that all big mines make big profits, which is a great mistake. We are now paying all we can afford to pay. We have reduced wages one-seventh and hoard one-seventh. The wages we are now paying are better, considering the decline in values all over the land, than the wages that were paid in the palmiest days of the Cœur d'Alenes. The men are glad of an opportunity to work at these wages, and the people of Wardner are more than satisfied."

A PROFITABLE INVESTMENT.—Respecting the placer mine on the Snake river, opposite Barnum island, the Shoshone *Journal* says two years ago Kidder & Graham worked the property, using a rocker, and made good wages. Kidder bought out Graham's interest and then secured a machine from Salt Lake that was guaranteed to raise 100 inches of water. He placed the machinery in position and mined while onlookers laughed, but now it is his turn to smile. During the past three weeks he took out $500, and the mine averages $20 a day. A great many inventions have been placed before the public during the past year or two, all having a new device for saving gold, but after a trial the practical miner resorts to the use of the old burlaps; they save more gold than any of the new fangled contrivances. What is needed to make the miner rich and the inventor independent, is some apparatus that will raise the water of Snake river and place it on the many bars that lay about 20 feet above the river. Give the miner water and he will catch the gold.

MONTANA.

PAID THE MEN.—On Tuesday of last week, says the Basin *Times*, the Basin and Bay State Mining Company paid its employes $20,940.35, being the amount of insurance money received on the Katie works, which were recently destroyed by fire. The men have been kept out of their wages for many months, but they have always been confident that in time they would be paid in full.

THE NEW EVA.—*Western Mining World*: The Longmaids have secured another valuable property in the New Eva mine in the St. Louis district, near Townsend. The price paid for the property is $25,000, one-fourth of which has been paid. The property has been operated for some time with good results. The ore is oxidyzed iron carrying gold, silver and lead and netting in the neighborhood of $50 per ton. The vein is said to be true fissure, cutting across all formations, and exposed for several feet.

UTAH.

SAVING THE GOLD. — *Tribune:* Since the Spaish mill in Bingham started up on its last run it has been operating quite successfully, and is said to be saving over fifty per cent of the silver in the ores in addition to the gold. The improvement is said to be due to the introduction of the method used at the Marion mill in Camp Floyd, which provides for an admixture of peroxide of sodium with the cyanide of potassium, the combination resulting in a saving of more of the gold as well as a considerable percentage of the silver.

BONDED THE BUTLER-BECK.—*Tribune*: W. W. Wallace of Sevier county has taken a bond and lease on the Butler-Beck mine and mill in the Gold Mountain district, and has already started up the mill. This property is located on the same vein as the famous Sevier mine, and is about two miles distant. The terms of the bond call for a price of $55,000, with a year's time in which to make the payment. Since the mill started up, ten days ago, it has been saving values to the extent of $12 per ton in gold on ore taken from the Tenaessee, one of the claims of the group.

COLORADO.

A NEW PLANT AT FLORENCE.—The Metallic Extraction Company will build another 150-ton cyanide plant at Florence. Superintendent Argall says he has plans prepared and is ready to receive bids for the construction of a new mill.

CRIPPLE CREEK GOLD OUTPUT.—The daily average shipment over the Midland is 325 tons of ore and over the Rio Grande 350 tons. This ore will average $50 a ton. The five mills, including the Cyanide, the Gillett and the Hartzell, have a daily capacity of 160 tons of low-grade ore. This will average $20 a ton, giving a total product from all sources of $1,000,000.

ARIZONA.

THE MAMMOTH RECONSTRUCTION SCHEME.—The following circular has been issued to the stockholders in the old Mammoth property, and is the basis upon which the contemplated reorganization of the company is to be made:

The present company to go into voluntary liquidation, and a new company (to be called the Mammoth-Collins Gold Mines, Limited,) to be formed to take over the property of the present company, together with the Collins mines, and to work the combined properties on a large scale, with a mill of 400 tons daily capacity, and with either a tramway from the mine to the mill, or a pump and pipe line from the river to the mine. The new company to have power to issue bonds to the same amount as the present company is authorized to issue the same. The present debenture holders to exchange their bonds for an equal amount of bonds in the new company to carry interest as from the 31st of December, 1895 and also to accept similar bonds in lieu of interest calculated to that date. The nominal capital of the company to be £100,000 in 2,000,000 shares of 1s. each. The present shareholders to receive one fully-paid share in the new company for each fully-paid share they now hold in the present company. The vendor of the Collins mines to procure subscriptions for 700,000 shares in the new company at par (realizing £35,000) for working capital. The purchase consideration for this company's property to be such an amount as may represent the sum of £20,000, and the nominal amount of the mortgage debentures issued by the company with accrued interest to the 31st December, 1895, and the said consideration shall be payable as to £20,000 in 400,000 fully-paid shares of 1s. each of the new company, and as to the balance in 10 per cent. First mortgage debentures, redeemable in 10 years from the 31st December, 1895, by means of a sinking fund commencing after the 31st December 1898. The purchase consideration for the Collins property to be £65,000, payable as to £45,000 in fully-paid shares of the new company taken at par, and as to the balance, £20,000 ($100,000,) in cash by means of a royalty of 50 cents (2s.) per ton on all ore from the property treated by the new company, the amount of such royalty to be ascertained and paid monthly until the balance (viz., $100,000—£20,000) of the full purchase money shall have been paid, the minimum royalty to be $2,500 per month and the balance remaining unpaid at the end of each month to bear interest at the rate of one-half per cent per month. The new company to discharge the liabilities of the old company, and pay the expenses of and incident to the carrying out of this scheme as provided by the agreements referred to in the notice of meeting.

IN THE GUNSIGHT COUNTRY.—The People's Milling, Mining and Investment Company of Yuma, Ariz., has recently taken fourteen claims in the Gunsight country, Pima county. The best developed of these claims is the Old Mine. The formation is granite and feldspar, carrying free milling gold. The vein is two feet wide. They will soon erect a mill and reduce the ore on the ground. This district is fourteen miles long and four miles wide, with ledges closely interwoven.

LOWER CALIFORNIA.

A NEW MANAGER. — A new manager has been appointed for the Progreso Mining Co., whose extensive properties are about fifty miles north of La Paz. The new official has power to thoroughly test the capacity of the mine, and if everything proves satisfactory will give permanent employment to 1,000 or 1,500 men.

MEXICO.

SOLD FOR HALF A MILLION. — *Oasis:* The Moctezuma Concentrating Co., organized under the laws of New Jersey, have sold their valuable mining claims at Nacosari, situated in the northeastern portion of the State of Sonora, to the Guggenheims of Monterey for the sum of $500,000 gold. The mining properties that have thus passed into the hands of the great smelting firm comprises twenty-three claims, six of which are of copper, the balance silver. They are situated in deep canyon about 120 miles from the railroad. A line will at once be constructed for a distance of twenty miles thereby saving the new owners $8 a ton for the transportation of the ores.

Sierra Buttes G. M. Co.'s Report.

On the 24th ult., the 51st semi-annual meeting of this company was held in London. F. Teadron presided. Of the Whitlock mine he said: The developments up to the present time at the Whitlock mine have been emiaently satisfactory. The working not only carried ore all the way down in the Whitlock shaft for a distance of 270 feet, but they also carried ore down in the new shaft some 400 feet, where for the whole distance from the adit level to abeut 50 feet below the 150-foot level, the ore was good. There the vein was broken by the same flat vein that has broken the main Whitlock shoot at the surface, or rather where the adit tunnel enters the lode in the Whitlock shaft. In this case, however, the breaking of the vein is not an injury to our property. On the contrary, to a certain extent, it is a great advantage, because the only effect it has had upon the vein has been to thrust it forward, and we have found the vein beyond the thrust is solid and good, and with as clear an indication of permanence as before the break, while as the break is crossed by another vein, whatever value there may be in that vein is so much to the good. In the 150-foot level below the adit level the vein may be taken—the paying part of the vein—at about 400 feet in length, and in the level driven out from the 250-foot level the vein has already been developed for nearly 200 feet, and they are still in ore. So that in the Whitlock we have the vein proved by two shafts going down, and it is only reasonable to suppose that since we have good ore in the two levels we have a large body of ore between these two levels. As the samples taken up to the present time average about $8 a ton, and as the crushing of the mill for the month is estimated at about $8 a ton, I think we have good reason to expect that in the Whitlock mine we have a property that will repay us, and repay us well, for the money it will cost us. Up to the present time—or, rather, to June 30—the expenditure on that mine amounted to £35,471, including the purchase money. It is to the Whitlock mine, so far as I can see, that we have mainly to look in the future. For up to the present time the developments in the other property we have bought—the Mammoth mine—are not satisfactory. That mine was bought very cheaply, for a very small sum of £5000, and up to the present time its development has cost us, including the purchase money, £10,379. We have developed it by continuing the level that we found when we were there, and by driving a deep tunnel to reach the lode, and then driving along the lode, and afterwards making a rise to the upper tunnel. If you read the directors' report, the impression made upon you, I should think, would be a very satisfactory one. The Mammoth mine was bought as a $5 proposition. The men who sold it did not claim that it would yield more than $5 a ton, but they calculated that it could be worked very cheaply. That was also the impression made upon our minds when we were there and also upon Mr. Johns. Assays were taken as fairly as possible of as much of the lode as was laid open by the men who had been working it, and in whose experience and veracity I still place entire confidence. The man who made the prospects told me he must have taken 1500 samples from the lode, day by day, opening out on it, and of these there were not twenty that did not show visible gold. Then we sent our most experienced mine captain to stay there some days, and take his own samples right through, as fairly as he possibly could. This he did with much more care than it was possible to exercise when I was present. He weighed the pulp and he weighed the gold, and put the average down at $6, and if you refer to the directors' report you will see that in many places it assayed $7. In the deep adit, when struck by the tunnel, the lode was of great width. It seemed to be wider below than in the upper tunnel—in some places 30 feet wide—and it appears that the gold is disseminated more or less through the whole of those thirty feet. If there were only a little more gold in the ore this would be a splendid property, but unless there is more gold in it than we have at present in that tunnel, it will be a great disappointment. Mr. Johns has always been a little fidgety about how this rock will come out in the stamps—how it will stand the test of stamping. He is afraid it may not turn out as well in the mill as when crushed by hand and then tested in the horn-spoon. In one of his visits, subsequent to the letters which appear in his report, he had the ore taken from four or five different places—about 200 lbs. in weight each—sent to San Francisco, to be crushed there in a mill and assayed. He seems to have been completely upset by the result of the assay. When he left the Mammoth, he wrote in good spirit; but the tone of his letters completely changed when these assays had been made. Now, I think the matter is of sufficient importance for me to read you an extract from his letter of September 21st, which we received on October 5th. He says: "You are well aware from the various reports sent to you that the ore has been developed from the main tunnel in the Mammoth mine so far is of too low a grade to be profitably milled." The main tunnel is the one where the lode is reached in depth. "The ore above the upper tunnel is hardly of sufficient quality to warrant the erection of a mill at the present time, and there is no certainty, of course, that the ore above the said upper tunnel will yield the estimated value placed upon it." By this he means that, although the ore in the tunnel may have averaged $6 all the way through, it does not follow that the same figure will be maintained to the surface. "I have," he continues, "lately had samples of 200 lbs. each taken from the upper tunnel, the raise from main tunnel, from the vein where cut through to the main tunnel, and from a cut into the vein from the south bottom drift. The results are not satisfactory, and my advice is not to erect the mill at present, but to complete the ditch, put in a compressor, so as to work power-drills, and a pump, should it be necessary, and sink the shaft 200 or 300 feet deeper, and test the vein at this greater depth. The property is certainly a very promising one. The vein is large, and there is gold all through it; and recent developments on the mother vein have discovered very rich mines where the surface and upper workings did not have the favorable indications we have. The general opinion of those who have visited the Mammoth is that we shall certainly develop a big mine by continuing the works downward." We have instructed Mr. Johns to sink the shaft, to put up a compressor and a five-stamp mill, and until that mill has been working for some time I refuse to change the opinion that I held and still hold—that the Mammoth will prove a very valuable property.

I have come to this conclusion, that mining in California, if you can only buy a mine at a proper price, and can get a vein of good appearance and prospects, is about the most profitable form of industry that one can go in for; but it certainly does not yield a fortune. We cannot complain of Uncle Sam. The last six months it produced 10,823 tons of ore, yielding on an average 28s. per ton, and costing 18s. 6d. Since we bought it the mine has produced 101,494 tons, of a money value of £193,253, and has actually given us up to the present time a profit of £79,000, of which we used £12,000 in the development of the property, have given you £56,866 in dividends, and have put £10,000 by. So that in six years it has yielded twice the money that it cost. With regard to the Buttes, is has lived on from month to month, and now it is living on from week to week, and the Eureka is a little better, for it is going to live on through the winter. This is the last news we have of the Eureka. Now, let us see what our position is. When the Buttes pays to the Eureka the small balance that it owes on the purchase of the new mines it will have a reserve left up to June 30 of the present value of £4000; and to pay you the dividend that we are paying you to-day we had to draw upon the old balance to the extent of £476, and if I thought we were going to keep on drawing upon the old balance I should have to ask you to be satisfied with half the dividend you are receiving, because the Buttes must put money by. But as we have every reason to believe the Whitlock will be a good earning property, and that the Whitlock and the Uncle Sam will more than earn the dividend of the Buttes, we not only pay you this dividend, but fully expect to pay you the same dividend in six months' time. With regard to the Eureka, after paying this dividend, it will have cash, including what is owing by the Buttes, and investments of the present value of £38,283; and, therefore, as the Eureka has so large a reserve, we have not hesitated to pay you the same dividend as you have had now for a long period, although to do so we have had to draw upon the reserve to the extent of £1669. As you were willing to have money put by out of your profits when things looked well, we shall not hesitate to use a portion of that money thus put by to maintain equal dividends when things are not looking so well, unless we see perfectly clearly that the bad state of affairs is going to continue, of which you will have warning in ample time. The chairman concluded by moving the adoption of the report and accounts. He then moved that a dividend of 6d per share, free of income tax, be and is hereby declared on the Sierra Buttes mine shares, payable on the 25th inst. and that a dividend of 9d per share, free of income tax, be and is hereby declared on the Plumas Eureka mine shares, payable on the 25th inst. Both motions were adopted.

Coast Industrial Notes.

—Los Angeles oil sells for fifty cents per barrel.

—The total British Columbia seal catch this year was 71,359 skins; last year, 94,701.

—Local corporations paid dividends amounting to $604,706 in October, nearly $50,000 more than in October '94.

—Secretary of the Navy Herbert has decided that two of the six Government twin-screw gunboats shall be built by the Union Iron Works of this city. They will cost $209,000 each.

—California has received eight awards on brandies at the Exposition of the Societie Philomathique held at Bordeaux, from the first of May until the first of November of this year.

—The Los Angeles company which has on hand the enterprise of the establishment of a smelter in which petroleum will be used for fuel, has received its incorporation papers from Sacramento.

—California has been awarded the gold medal for the best State display at the Atlanta Exposition. A number of other States were awarded silver medals, but California alone received the honor of a gold medal.

—The National Coal Mining Company has incorporated at Portland, Or., to do a general mining business, etc.; capital stock, $220,000. Iucorporators—J. B. Parker, F. M. Batchelor, G. Balsamy and R. A. Reid.

—There are in operation in this city 265 miles of street railway track—106 miles cable railway, 104 electric road, 35 horse tramway and 20 steam. The number of cars in daily use is 696 and the number of employes is 2772.

—The Southern Pacific has announced to the merchants of Salt Lake its inability to arrange for putting into Salt Lake the rates in force from San Francisco to Ogden, as its negotiations with lines from Ogden to Salt Lake are barren of satisfactory results.

—Coal receipts at San Francisco by water, exclusive of product of Mt. Diablo mines, for the first ten months of the year were as follows: Puget Sound 342,374 tons, Oregon 37,955, Eastern 17,087, Alaska 1,050, Australia 174,890, British Columbia 441,484, English 110,440, Welsh 5,892, Japan 5,697; total, 1,136,869 tons.

—The Gerlach Wave Motor Co., at Capitola, are having built a wave motor with 720 square feet of paddle surface, which they calculate will give 400 H. P. They are spending nearly $20,000, and say the motor will develop power commensurate in cost to that produced by coal were that commodity procurable at 25 cents per ton.

—The stockholders of the Nevada County Narrow-Gauge Railroad Company will meet December 31st, to decide upon a proposition to issue bonds to the amount of $250,000, to be used in retiring that much bonded indebtedness. The first mortgage bonds now outstanding are for $1000 each, and will have run twenty years on the date of the meeting. They bear interest at the rate of 8 per cent per annum.

—The *Lower Californian*, speaking of the guano beds at the island of San Martin, off the coast of that region, says: "These guano deposits are not as good as those on the Peruvian coast, owing to the fact that they are occasionally damaged by rain, and until quite recently were thought to be of little value, though now it is found to be worth from $12 to $15 a ton as fertilizer in the California market. The deposits, by concession from the Mexican government, belong to the Mexican Land and Colonization Company."

—In the case of Jno. Hammond vs. the Stockton Combined Harvester and Agricultural Works, the U. S. Circuit Court of Appeals has decided that there was no infringement; that Hammond's patent for a railway car body was only "an exercise of the imitative faculty, and did not rise to the dignity of invention." The Court has, apparently, not coincident views with Mr. Smyth in his recent article, "Is the Inventive Faculty a Myth?"—which article, by the way, has attracted universal attention.

—The London *Times* of Oct. 28 has a three-column article on the Nicaraguan canal from a correspondent recently there, who says it is clear the project cannot be carried through as a private undertaking, but that it must be under the auspices of some strong Government, which without doubt must be the United States. He thinks the cost will be nearer $150,000,000 than $100,000,000. The true course of labor, he thinks, will undoubtedly be the West Indies negro labor, being far superior to the Chinese.

—A discovery of anthracite coal is reported from Iron county, Utah, which, if true, will become an important factor in the future development of that region. Deposits of iron ore are found in that locality, and beds of bituminous coal, but anthracite was not known to exist there. There has been some talk of establishing furnaces and steel works, and it is known that the Rio Grande Western has in contemplation an extension of its Salina branch to the iron fields. Several railroad surveys from Salt Lake to Los Angeles pass through that coal and iron belt.

—A new line of railway to connect the Atlantic and Pacific coasts of Nicarauga will soon be projected in that country. The work will be placed in the hands of an engineer of international prominence, and the funds to complete it will be furnished by the Nicaraguan government. The only line of railway in the republic at present extends from the port of Corinto, which came into prominence last spring through its temporary occupation by the British forces under Admiral Stevenson, to the capital, Managua, thence to Grenada, in the interior. The proposed new road will connect with the present line at a point near Corinto, and will run in a southeasterly direction to the city of Rame, which lies at the headwaters of the Bluefields river, about sixty miles from Bluefields, on the Atlantic coast. As the Bluefields river is navigable for steamers drawing an average depth of water, the new railway will permit shipments of coffee and other products direct to Rame, at a great saving of time and expense as compared with the present arrangement. The road will also result in developing the rich coffee fields of the interior, and thus greatly enhance the profits connected with that industry. At the present price of coffee, it is estimated that a plantation costing $25,000 will pay for itself in five years, and it is to this branch of agriculture that much of the capital of Nicaragua is being applied.

Commercial Paragraphs.

M. A. GRAHAM is putting up a 30 H. P. marine gasoline engine for an 80-ft. bay schooner.

THE Union Gas Engine Co. has sent a 25 H. P. engine to the Confidence mine, at Daggett, San Bernardino Co.

THE Siemens and Halske Electric Company, successor to the Grant Locomotive Works, has an order for 55 ten-wheel engines for the Burlington & Quincy road.

THE firm of John A. Roeblings' Sons Co. is supplying 217,000 pounds of wire for the Big Cottonwood, Utah, transmission plant—over 200 miles of different sized wire.

THE Vulcan Iron Works, in addition to wire ropeways, mining and sawmill machinery, manufactures ice plants, one of which was shipped this week to Honolulu.

THE Trustees of Reclamation District No. 349, on Sutter Island, have given to the Krogh Manufacturing Company a contract to put in a mammoth pumping plant on the island. The contract price is $10,870.

BEMENT, MILES & CO., of Philadelphia, report among their recent shipments a lathe to this city with a 10½-foot swing and four independent carriages, which turns 50 feet long and weighs 350,000 pounds. Another shipment was to Buda Pesth.

WM. HOLLAND, brass founder and finisher, 60 S. Canal St., Chicago, says he has recently perfected a process for casting copper which is hard and entirely free from blowholes. He has a mixture which is especially adapted for making armature commutator segments.

THE Fulton Engineering and Shipbuilding Works are supplying the Alaska-Willoughby Company with a 10-stamp mill to be run by water power, three Pelton wheels, and a 6-ft. wheel in the mill to run the battery, a 3-ft. wheel for the rock breaker, and a 2-ft. wheel for the 3 Frue concentrators.

JOHANNESBURG, SOUTH AFRICA, is to have an industrial exhibition next May and June. The area of the exhibition grounds will be 500,000 square feet; the buildings themselves will cover 100,000 feet. Intending exhibitors are invited to communicate with Charles P. de Garmo, Johannesburg, S. A. R.

THE management of the Hicks quartz mill, Ashland, Or., are adding to their present plant a new 5-stamp combination mill from the Joshua Heudy Co. of San Francisco, consisting of the stamp mill proper, a concentrator, two pans, each of 5 feet dimension, and an 8-foot settler. The new mill will work more refractory ores and insures a more perfect saving of the gold. The total daily capacity is 18 tons.

THE Gates Iron Works last week shipped fifteen carloads of machinery to South Africa. The shipment includes three large Corliss engines, one of which is for hoisting, one for pumping and the third for milling purposes, also several rock and ore crushers. The Gates people are also just completing the erection and installation of the largest chlorination plant in the world for the Kildavan Mining Co. at Deadwood, South Dakota. The plant will handle 100 tons of gold ore per day.

REGARDING speed of mine hoists, W. M. Ruth, of the Edward P. Allis Co. of Milwaukee, Wis., says: "At the Tamarack mine, in the Lake Superior copper region, thirty-nine cars per hour were recently raised from a depth of 3186 feet for six consecutive hours. This is equivalent to an average hoisting speed of 3180 feet per minute, or 36.1 miles an hour, allowing a trifle over one minute for loading and unloading the cages. The load of rock is 6720 pounds. This work was performed with a direct-acting or first motion hoisting engine made by the Edward P. Allis Company. The steam cylinders are 42x84 inches and the hoisting drum 30 feet in diameter. It has been in service several years. At another shaft owned by the Tamarack Mining Company a trip was made some days ago from a depth of 4500 feet in one and one-quarter minutes, equivalent to a speed of 3600 feet per minute, or nearly 41 miles an hour. At this shaft the engine, which was also built by the Edward P. Allis Company, is 32x84 inches and the hoisting drum, a double cone, 13½ feet and 36 feet diameter; each cone will carry 6000 feet of rope. For short periods, speeds as high as 4200 feet per minute have been observed."

FOR SALE!

120 Acres in San Diego County,

With one ledge 4 feet quartz and two cross ledges 2 feet: extensions of well known mines. Inquire 1523 Stockton St., San Francisco.

Personal.

J. J. CRAWFORD has returned from El Dorado county.

CAPT. W. L. MERRY has bought the Carley mine, Calaveras Co.

F. C. MATHYAS, field assistant to the State Mineralogist, is in Lake Co.

HENRY SHADE will be the new superintendent of the Virginia, Nev., gas works.

A. S. HALLIDIE has returned from Boston and New York via British Columbia.

CLAY GARRARD has assumed charge of the Plymouth Rock mine, near Jenny Lind.

ED BOYCE of the Cœur d'Alenes has gone to Alaska to try to organize a miners' union.

J. H. MEANS of the State Mining Bureau is collecting data and statistics in Marysville.

JOSEPH WEISSBEIN, general manager of the W. Y. O. D. mine, has returned to Grass Valley.

A. G. BRIGGS has assumed the superintendency of the Whitlock property, Mariposa county.

A. THURSTON HEYDON has resigned the foremanship of the Lady Emma mine, at Kelsey, Cal.

W. B. NICHOLS is present superintendent of the Merrill G. M. Co.'s property, at Basin, Montana.

G. WHARTON JAMES of Mt. Lowe is lecturing in Arizona on "The Grand Canyon of the Colorado."

V. P. YELMINI of Amador is examining mining property at Glencoe and West Point, Calaveras Co.

M. A. GRAHAM, of the Oriental Gas Engine Co., has returned from a visit to his mine in Shasta county.

CAPT. MESSENGER has been appointed postmaster at the new office at the Gwin mine, Calaveras county.

HENRY PIPER of Butte is now master mechanic of the Tiger and Poorman properties in the Cœur d'Alenes.

RUSSELL SCHOOLEY of Dayton, Nev., goes to South Africa this week as engineer in a Johannesburg mine.

CHAS. KAHL, former foreman of the Providence, is now superintendent of the Cadmus mine at Nevada City.

GEO. B. DENNIS, of Spokane, Wash., has been elected president of the Northwestern Miners' Association.

A. H. RICKETTS has been appointed attorney for the Mineral Land Committee of the California Miners' Association.

S. W. DORSEY, the chief promoter of the Colorado Southern Railroad, is in this city studying some mining propositions.

W. GARRARD of Angels has taken charge of the Santa Rosa. This is the property recently secured by Messrs. Lane & Hayward.

R. H. CAMPBELL of Siskiyou county is at Ashcroft, B. C., with a view of putting in a hydraulic elevator plant at the Horsefly.

A. N. BUTTS, formerly of Los Angeles, will superintend operations on the Bolitho mine, near Angels, Calaveras Co., this winter.

C. C. MAY, Davenport, Wash., has taken charge of the Triune mine and mill at Golden and will push both to their fullest capacity.

H. M. GREGGS takes the place of W. J. Townley as superintendent of the Sanger mine, Baker City, Or., and is about to resume work thereon.

WALDEMAR LINDGREN, whose excellent geological work has received much recent notice, is about to make an examination of the Pine Nut district, Nevada.

E. S. DE GOLYER has returned from Salt Lake to San Andreas, for the winter, where he will superintend operations on the Gottschalk and Donnellan mines.

DR. BOYSON has succeeded in interesting French capital in the Pioneer mine, Plymoutb district, Amador county, and Superintendent Robinson has resumed work.

JOSEPH L. GIROUX, superintendent of the mines and smelting works of the United Verde Copper Co. at Jerome, Ariz., is at Gila Bend examining the Volcanic gold property.

GEO. GARSIDE of Juneau has been appointed superintendent of the Alaska-Willougbby Company, which will operate the Willoughby property at Funter bay, Admiralty island, Alaska.

J. L. LYON of Oakland is superintendent of the Monarch mine, at Rough and Ready. Hoisting works will be built, the shaft retimbered, and by New Years sinking on the ledge will begin.

PHILIP DEIDESHEIMER is reported acquiring considerable mining property in Calaveras and Tuolumne counties. A local paper announces his recent purchase of the Spring Gulch mine, near San Andreas, for $60,000.

E. H. MOVIUS, Secretary Montana Mineral Land Commission, writes that the October work of the Commission was important and effectual. Twelve full sections and fifty fractional sections were examined during the month.

PRESIDENT JEFFREY of the Denver and Rio Grande Road, was formerly a mechanic and railroad engineer. He says that he has come to "the conclusion that the wage question is not so important as honest, capable, faithful and reliable service. A careless engineer can lose for his company thousands of dollars yearly on his engine, and it has taken the most careful, painstaking scrutiny to discover the loss."

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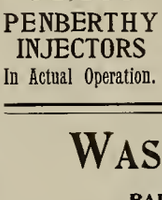
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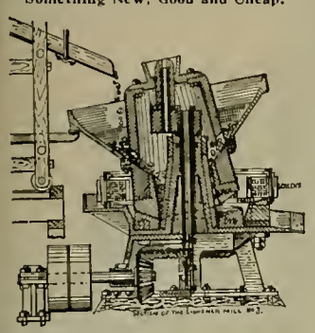
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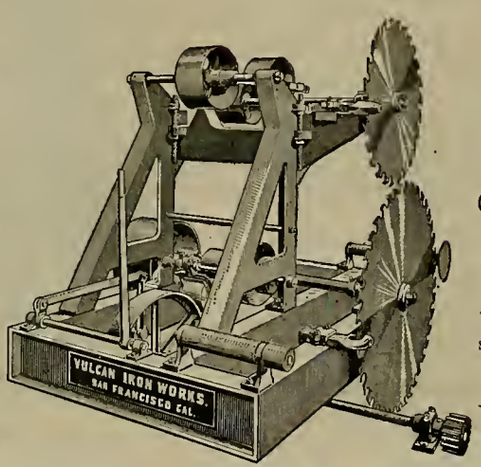
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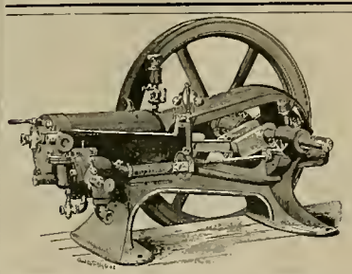
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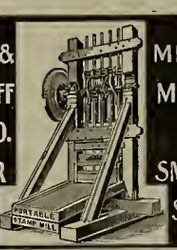
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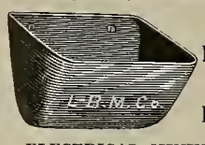
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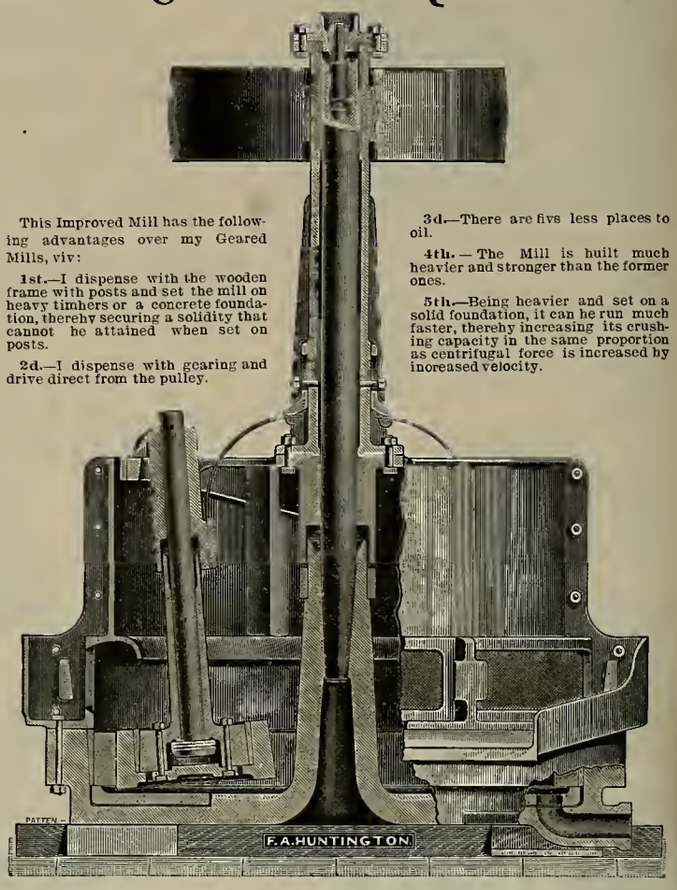
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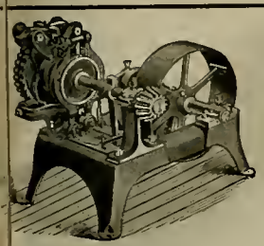
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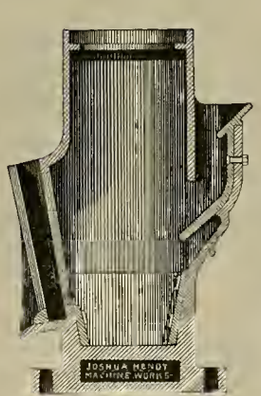
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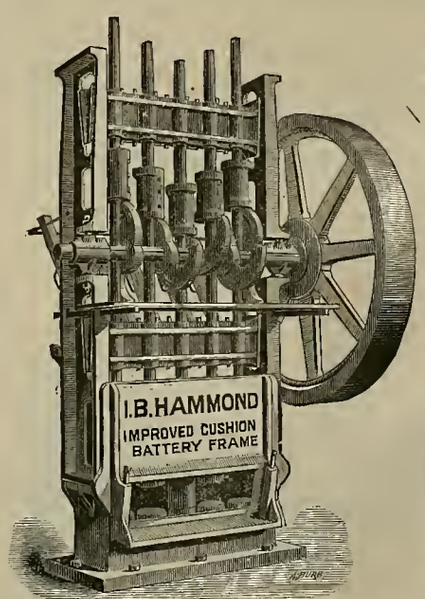
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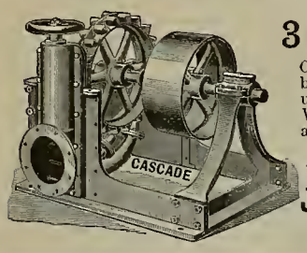
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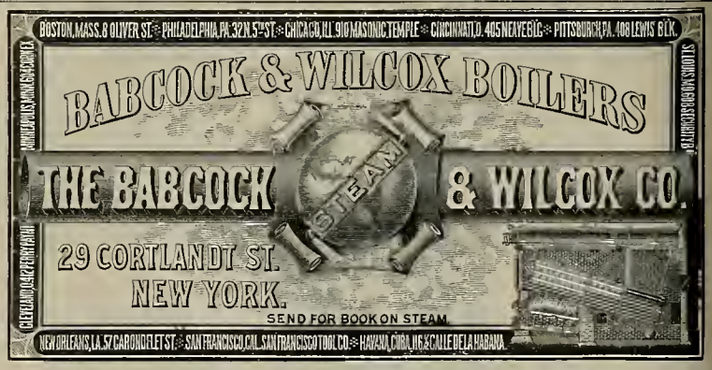
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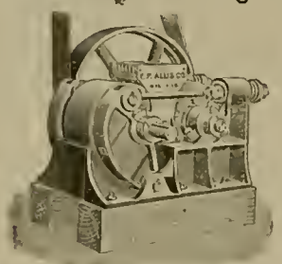
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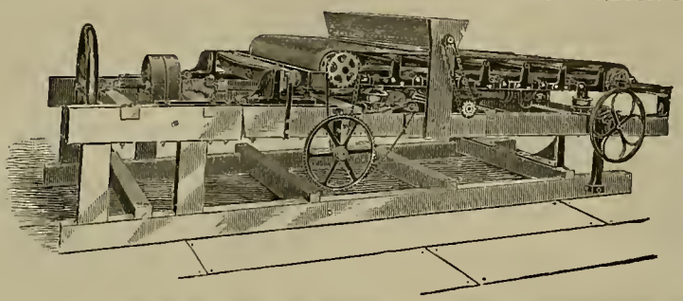
A MARVEL of Simplicity, Durability and Effectiveness combining both Side and End Motion with a Bumping Motion.

SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated. WHILST IN OPERATION.

CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

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Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1895.

THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a True, as after many years' experience with different concentrators, I believed them to be the best.

Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.

Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.

You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully

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IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.

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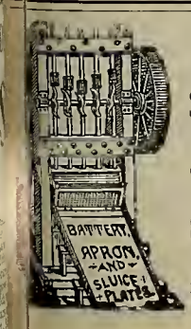


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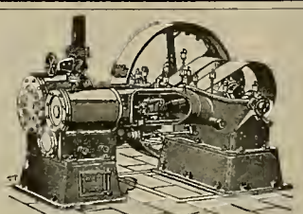
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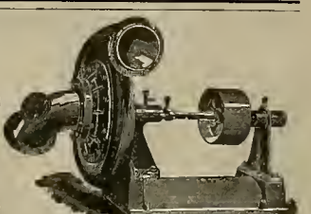
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FOR EVERY DUTY AND CAPACITY.

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625 Sixth Street ..... San Francisco.

Market Reports.

The Markets.

SAN FRANCISCO, Nov. 7. 1895.

Steel and iron are still depressed; silver is steady, with a rising tendency—$8,000,000 were transferred on the 1st to Japan by the Bank of England, as the first payment of the Chinese indemnity. It is thought prohahle that £3,000,000 will he used immediately to pay dehts incurred for ships and war material. It is expected that the halance will he wanted soon in payment for more ships and munitions already ordered. It is not considered likely that any gold will he taken out of the hanks, but it is possihle that some of the gold will he used to purchase silver, which expectation tends to keep up the price of silver.

D. Houston & Co. of New York, in their "copper circular" of the 1st inst., say:

The steady tone of the market noted at the heginning of last month has given way to an easier feeling and lower prices. Consumers having bought freely some time previously, demand during Octoher was quiet and in sympathy with general financial conditions; holders are more ready to meet inquiries at figures ¾ to ½ helow opening prices in October. Lake copper can he bought now at 11¾@11⅞ cents per pound. The larger manufacturers are pretty well supplied with copper on contracts for the halance of the year, and are therefore inclined to defer anticipating future necessities heyond what they have already arranged for. The decline in the market has not been attended with any active buying movement on the part of consumers, while, on the other hand, producers display no anxjety to force sales. The market may be characterized as a waiting one.

The wild foreign speculation in South African gold mining securities, and to some extent the political situation in Europe, and the approaching meeting of Congress here, may he regarded as responsihle in a measure for the present state of the copper market. The enormous aggregation of capital involved, and the gigantic character of the speculation in "Kaffirs," have awakened apprehension in many quarters, and that suhtle phase of the mind called "sentiment" has hecome hypersensitive over what may prove, after all, a danger more hypothetical than real. However that may he, the foregoing are factors of great importance in the financial and husiness world at present.

Actual consumption of copper in this country continues very large, and according to good authority in some departments of manufacture was even greater the past month than during tbe month previous. English consumption also shows an increase for the three months ending September 30 of more than 18 per cent compared with the second quarter of this year. The better grades of copper in Europe are pretty well ahsorhed, until the entire stock of American copper in England hy the middle of Octoher had dwindled down to 1606 tons. Exports of copper from this country have lately fallen helow the allowance under the old agreement, and the arrivals of American copper in England during the first nine months of 1895 were 9594 tons less than during the same period in 1894. The London copper market has fluctuated hetween £47 5s spot, and £47 12s 6d futures on October 4, and £44 17s 6d spot, and £45 5s futures on October 29, with large sales.

Copper production, in tons of 2240 pounds, as follows:

September—	*1895.*	*1894.*	*Increase.*	*Decrease.*
United States....	15,361	12,757	2,594	.....
European.....	6,947	7,110	.....	163
U. S. Exports	4,106	7,093	.....	2,987
First 9 Months—				
United States....	124,077	122,042	2,035	.....
European.....	63,548	66,730	.....	3,182
U. S. Exports	48,849	60,496	.....	11,647

After the advance in copper the large companies, such as the Calumet and Hecla and Anaconda, increased their output materially. It would undouhtedly he to the interests of the market in preserving its stahility if these leading producers would to some extent curtail their production.

Exports of copper during Octoher were 3801 tons, and arrivals from Europe 450 tons fine copper.

European copper statistics per cahle to-day show a decrease in stocks of 1630 tons aud in visihle supply of 2380 tons.

The London market for copper, closing quotations for G. M. B.'s this date is £45 2s 6d spot and £45 10s futures.

The market for copper in New York quotes 11¾@11⅞c for Lake, 11⅜@11½c for electrolytic and 11@11¼ for casting hrands.

New York Metal Market.

NEW YORK, Nov. 7.—PIG IRON—Southern, 12@14.50; Northern, 12@14.00.

COPPER — Brokers', 11¾c; exchange, 11.65c.

LEAD—Brokers', $3.15; exchange, $3.27½.

TIN—Straits, 14.60@14.75c.

SPELTER—Domestic, $3.90.

New York Silver Prices.

NEW YORK, Nov. 7.—Following are the closing prices for the week:

	Silver in—			
	London.	*N. Y.*	*Copper.*	*Lead.*
Friday.....	31	67⅝	11 80	.....
Saturday.....	30¾	67⅝	11 75	3 15
Monday.....	31	67¾	.....	3 20
Tuesday.....	31⅛	67½	.....	.....
Wednesday.....	30⅝	67⅝	12 00	3 15
Thursday.....	30¾	67½	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.87½
London Merchants	$4.86½
London Sight Bankers	$4.89

Refined Silver, per ounce	67½c
Mexican Dollars, nominal	55c

San Francisco Metal Market.

COPPER.			
Bolt	½ & 5-16, 20c; ¾ and larger, 21c		
Lake Superior Sheathing	22	@	—
Ingot, jobbing	—	@	18
Ingot, wholesale	17	@	16
Sheet copper	—	@	21
ZINC.			
Sheet	9½@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "	"		1 45
Buck, Balls and Chilled, do, "	"		1 45
IRON.			
American Soft	16 00	@	18 00
Pig, per ton	18 00	@	20 00
STEEL.			
English, lh	16	@	19
ANTIMONY.			
Per lh	—	@	10½
PIG TIN.			
Per lh	15	@	16 00
QUICKSILVER.			
Home trade, per flask	39 00	@	40 —
BORAX.			
Refined, in car lots	—	@	5⅛
Refined, in sacks and harrels	—	@	5⅝
Powdered, in car lots	—	@	5⅝
Concentrated, "	—	@	4⅞
TIN PLATE.			
Per hx	5 25	@	6 00
ZINC.			
Sheet	8½@		
COAL.			
SPOT FROM YARD—PER TON.			
Wellington			$ 8 00
Greta			7 50
Nanaimo			7 00
Gilman			6 50
Seattle			6 00
Coos Bay			5 00
Cannel			8 50
Egg, hard			12 50
Wallsend			7 50
Scotch Splint			7 50
Brymbo			7 50
TO ARRIVE—CARGO LOTS.			
Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —
NAILS.			
Wire			$3 50
Cut			3 25
LUMBER.			
SAN FRANCISCO—WHOLESALE.			
Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, Novemher 7, 1895.

Immediately following last week's issue, the share market hegan to weaken, resulting in low prices Monday morning. Although the decline was only about ten per cent, yet combined with a sick, inactive tone, it caused a panicky feeling with dealers who operated on the complexion of the market. Many hrokers caught the panic fever and threw out to customers the stocks that were not well protected hy margin. Who hought the shares and who have been steady huyers for months past is a question that is heing discussed in more quarters than one. It is impossihle to disguise the fact that there has been and is still a steady concentration of shares. It cannot he correctly affirmed that outside pools have been successful in this line, for the temptation to make turns has been too pronounced to resist. It would seem as if there has been a quiet absorption hy a comhination or else hy a large moneyed man, prohahly for the purpose of promoting a deal on the favorable conditions of several of the mines, with all indications pointing in the direction of two or more ore strikes of some importance. Never within the history of the Comstock have so few shares heen held hy the outside public. Disgust and a decided feeling that there is no prospect in the near future are too marked with outsiders to even helieve they are interesting themselves in the game. Then who is?

For several years past work from one end of the lode to the other has been made with the purpose of getting all the mines in condition for active and energetic developing. Of necessity, so as to get outsiders to pay assessments on as many shares as possihle, there have heen false moves on the upgrade, hut these very moves have contrihuted no little in causing the puhlic to sell, not at the advances, but around the low prices. How long this kind of manipulation will continue it is hard to say, hut, judging the future hy the past, it should not he long hefore a hull movement sets in; it may even now be moving in this direction, notwithstanding inside cappers are croaking and putting out reports of slightly lower prices hefore the deal sets in. If there is anything good in the future, and everythiug points in that direction, present prices justify huying, even if the general market does go down from ten to twenty-five per cent. A person that waits for the lowest prices hefore huying gets left the same as does the one who waits for the highest prices before selling. There are factors at work in the East which caunot he ignored, and which will force a deal of some magnitude hefore twelve months, fight against them as insiders may. Aside from this the suits are in a fair way to he out of the way soon, hesides which the suit against proxy voting will cause mine managers to be rather chary in securing control hy such dishonest and unscrupulous methods. Brokers should unite against giving proxies. What have they gained hy such a course? They have not heen ahle to pay current expenses. Manipulators have reason to helieve, judging from the past, that hrokers, after heing kicked and cuffed, will lick the hands of those supposed to he in control whenever given a crumh. This ought, in the interest of all concerned, to be changed hy brokers proving themselves men, and not cringing animals, currying favors from those who use them so hadly.

From the Comstock mines the news was never before of so favorahle a character. From one end of the Comstock to the other more work has been and is still being done than ever hefore known. In several of the mines ore has heen struck, which, when developed, will result in dividends; but how long the managers will continue to have work done so as to hring ahout assessments, it is hard to say. They cannot do it forever, and when forced to show up ore a much hetter state of affairs can he looked for. In the Alta group the work is unquestionably in the direction of ore developments, and ore, too, that will pay well. In the Gold Hill mines, from Caledonia to Ophir, the work promises surprises to those who have no confidence in the mines. In at least three, strikes have been made which are heing developed in such a way as to lead to the extraction of $40 to $80 ore, and even higher, before the end of 1896. This is all to the west. The ore is gold-bearing. In the middle group there is every promise that two or three of the mines will also surprise the skeptics, yet it may be several weeks first. In the north-end group the work under way is all that can he asked. It points to strikes before next spring passes, and strikes, too, of some importance. In this issue it is not necessary to particularize, hut dealers can rest assured of something important heing uncovered. They uust not run away with the idea that the share market will go up right along, for there must and will he heavy breaks and strong depressions—it is these that make the gamble and hring in outside moneyed traders. Always he prepared for the unexpected.

From the Bodies private news is more favorable, but official letters are of the same character as they have been for some time past.

The following is the usual monthly statement of moneys on hand:

BODIE MINES.		Exchequer	$ 691 91
Bodie	$17,300 80	Gould & Curry	2,175 97
Mono	2,651 79	Hale & Norc'ss	2,3 4 60
Standard	14,560 14	Julia	896 09
Syndicate	1,054 17	Justice	2,148 87
WASHOE MINES.		Kentuck	6,605 74
Alpha	$ 2,414 31	Lady Wash'n	537 18
Alta	7,179 04	Mexican	5,684 84
Andes	6,184 63	Occidental	1,066 78
Belcher	8,553 84	Ophir	2,604 86
Best & Belcher	3,938 97	Overman	4,556 19
Bullion	2,622 35	Potosi	21,864 93
Caledonia	1,704 45	Savage	7,656 83
Challenge	924 95	Scorpion	85 89
Chollar	6,064 02	Seg. Belcher	5,793 34
Confidence	2,231 67	Silver Hill	738 50
Con. Imperial	4,368 62	Sierra Nevada	16,405 89
Con. New York	810 93	Union Con	12,082 15
Crown Point	6,021 68	Utah	3,678 53
E. Sierra Nev.	31 89		

The following illustrates the changes of the week:

MINES.	Oct. 31	Nov. 7.
Alpha	$ 23	.....
Alta Consolidated	.....	.....
Andes	32	$ 31
Belcher	46	.....
Best & Belcher	80	75
Bodie	27	32
Bullion	10	13
Challenge	53	.....
Chollar	.....	38
Confidence	1 45	1 40
Consolidated California and Virginia	2 60	2 50
Consolidated New York	.....	.....
Crown Point	.....	.....
Exchequer	05	.....
Gould & Curry	38	38
Hale & Norcross	1 45	.....
Justice	.....	.....
Mexican	58	58
Ophir	1 35	1 30
Overman	12	.....
Potosi	59	60
Savage	52	50
Sierra Nevada	90	83
Union	65	64
Utah	.....	07
Yellow Jacket	34	33

San Francisco Stock Board Sales.

SAN FRANCISCO, Nov. 7, 1895.

9:30 A. M. SESSION.

400 Bulwer	06	900	30
100 Chollar	38	200 Potosi	60
200 C. C. & Va	2 40	100	59
200 Confidence	1 40	300 S Belcher	12
100 Con Imperial	03	300 Savage	49
500 Mexican	57	200	50
600	58	500 Union	63
300 Gould & Curry	38	200	64
1500 Occidental	28	200 Yellow Jacket	33
100	29	100	32

SECOND SESSION—2:30 P. M.

100 Ophir	1 30	200	33
150 Mexican	57	700 Utah	07
150	58	300 Bullion	13
100 Gould & Curry	36	100 Union	64
300 Best & Belcher	75	900 Occidental	29
100 Con Cal & Va	2 50	1100	30
200 Savage	50	100 Andes	31
300 Sierra Nevada	82	500 Bodie	32
50	81		

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	*No.*	*Amt.*	*Levied, Delinq't and Sale.*	*Secretary.*
Alpha Con, Nev	15	10c	Sept 30, Nov 5, Nov 28	C E Elliott, 79 Nevada Block
Alta S M Co, Nev	50	10c	Sept 16, Oct 21, Nov 11	J E Jacobus, 309 Montgomery
Best & Belcher M Co, Nev	58	25c	Nov 4, Dec 9, Dec 30	M Jaffe, 309 Montgomery
Bullion M Co, Nev	46	10c	Nov 4, Dec 9, Dec 30	R R Grayson, 331 Pine
Bulwer Con M Co, Cal	11	5c	Oct 29, Dec 4, Dec 31	C E Elliot, 309 Montgomery
Exchequer M Co, Nev	38	5c	Oct 21, Nov 25, Dec 19	C E Elliott, 309 Montgomery
Gould & Curry S M Co, Nev	77	15c	Nov 5, Dec 10, Dec 30	A K Durbrow, 309 Montgomery
Gray Eagle M Co, Cal	41	5c	Sept 23, Oct 28, Nov 22	W J Garnett, 308 Pine
Iowa Mining Co, Nev	21	5c	Oct 23, Nov 26, Dec 16	R L Thomas, 419 California
Marguerite M Co, Cal	1	10c	Nov 2, Dec 2, Jan 5	Chas. Winters, 237 12th St., S F
Nevada Queen M Co, Nev	9	5c	Sept 13, Oct 16, Nov 12	Wm. Bowers, 331 Pine
Occidental Con M Co, Nev	20	10c	Oct 1, Nov 14, Nov 25	Alfred K Durbrow, 69 Nevada Block
Savage Mining Co, Nev	87	20c	Sept 20, Oct 23, Nov 12	E B Holmes, 309 Montgomery
Superior M & M Co, Cal	1	5c	Nov 5, Dec 9, Dec 30	J Howard Barnard, 916 Market, S F

MEETINGS.

Company and Location.	*Secretary and Office in S. F.*	*Date*
Challenge Con M Co, Nev	C L McCoy, Mills Building	Nov 21
Occidental Con M Co, Nev	A K Durhrow, 309 Montgomery	Nov 18

Assessment Notices.

IOWA MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia City, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the 23d day of October, 1895, an assessment (No. 21) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 2, No. 419 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of November, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on MONDAY, the 16th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

R. L. THOMAS, Secretary.

Office—Room 2, 419 California street, San Francisco, California.

GOULD & CURRY SILVER MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1895, an assessment (No. 77) of Fifteen (15) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of December, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

BEST & BELCHER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the fourth (4th) day of November, 1895, an assessment (No. 59) of twenty-five cents (25 cents) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the ninth (9th) day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

M. JAFFE, Secretary.

Office—Room 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of November, 1895, an assessment (No. 46) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 20, No. 331 Pine street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office—Room 20, No. 331 Pine street, San Francisco, California.

SUPERIOR MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Placerville, El Dorado county, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the fifth day of November, 1895, an assessment (No. 1) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 916 Market street, Room 81, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of December, 1895, will be delinquent and advertised for sale at public auction, and on ess payment is made before, will be sold on WEDNESDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. HOWARD BARNARD, Secretary.

Office—Room 81, 916 Market street, San Francisco, California.

MARGUERITE GOLD MINING AND MILLING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Auburn, Placer county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the second day of November, 1895, an assessment (No. 1) of 10 cents per share was levied upon the whole of the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at office of the company, 237 Twelfth street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second day of December, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the fifth day of January, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

CHAS. WINTERS, Secretary.

Office—237 Twelfth street, San Francisco, California. Office hours from 4 to 6 o'clock P. M. Bring your certificate.

"Ratio of Gold and Silver."

TO THE EDITOR:—In this week's issue you say the ratio of gold to silver is 32.56. I don't believe it. Where do you get your figures?
Virginia, Nev., Nov. 5, '95. READER.

[The only item in the issue of Nov. 2d on that subject is one in "Concentrates," which is reprinted in full: "According to the annual report of the director of the Mint, the ratio of gold to silver during the year was 32.56." This is probably the statement from which our Virginia, Nevada, reader so promptly and forcibly dissents. He will observe that the figures are not ours and the statement was credited to and based upon the official report of the director of the U. S. Mint for the calendar year 1894.

However, since the matter is questioned, and as the subject is one of general interest, a few figures are in order. The figures are obtained from U. S. reports. Their accuracy has not been disputed, and their bearing on the subject is a cold matter of fact not susceptible of argument. Their acceptance or rejection in no way affects the case.

According to the official figures, the ratio value between gold and silver is determined by comparison between their bullion value.

At the date of this writing (Nov. 7th) the silver in a standard dollar is worth as bullion about 52.65 cents, making the ratio value between gold and silver about 30.47 to 1. The average fluctuations for the last ten years are shown in the following table:

Year.	Price.	Ratio.
1885	$1.0045	19.41 to 1
1886	.9946	20.78 to 1
1887	.9782	21.13 to 1
1888	.9399	21.99 to 1
1889	.9358	22.10 to 1
1890	1.0463	19.76 to 1
1891	.9878	20.92 to 1
1892	.871	23.72 to 1
1893	.7803	26.49 to 1
1894	.6348	32.56 to 1

It is to be borne in mind that the present relative value of fine gold bullion per ounce—$20.67—and the present relative value of fine silver bullion per ounce—67.5 cents—is the basis of these calculations, which is a simple divisiou of the price of an ounce of gold by the price of an ounce of silver, and has nothing to do with the "purity" of the metals nor the demonetization of silver, nor the depreciation of that metal, nor the ratio of 16 to 1, nor free coinage of silver, nor any of the political, financial or any other of the public questions connected therewith so widely discussed. The one is a subject of argument, opinion, legislation and agreement: the other is an existing fact as little susceptible of argument as the date of this paper or the chemical composition of water.]

A Few of Many Unsolicited Friendly Notices.

Extends Congratulations.

One of the very few journals of the country which received an award at the World's Columbian Exposition was the MINING AND SCIENTIFIC PRESS. The diploma was for the character of its editorials and the accuracy and reliability of its mining news. We extend congratulations.—*The Investor, Los Angeles, Cal.*

Thorough Reliability.

The MINING AND SCIENTIFIC PRESS of October 12th contains on its front page two excellent illustrations of the new hoisting works of the Louisa mine at Coulterville. It is doing a great work for Mariposa county through the amount of space it devotes weekly to an accurate resume of mining matters in this section. Its thorough reliability, coupled with its large circulation among the leading mining men and investing public, make it at once the best friend this undeveloped region has. The people of Coulterville, in particular, should subscribe liberally for it.—*Mariposa Miner, Coulterville, Cal.*

Best in the World.

The MINING AND SCIENTIFIC PRESS of October 19th contains a complete official report of the late Miners' Convention. The PRESS has been greatly improved, and has become the best mining and scientific publication in the world. It is cheap at its price, $3 a year.—*Gazette, Georgetown, Cal.*

A Mass of Mining Intelligence.

If there is a miner in California, Nevada or Arizona who does not take the MINING AND SCIENTIFIC PRESS of San Francisco, he should do so at once. It is one mass of mining intelligence, and very reliable.—*Eye, Needles, Cal.*

WANTED.—POSITION IN A QUARTZ Mill by a young man, as engineer or battery man, can run concentrators and dynamos, and give references. F. W. L., Box A., this office.

WANTED.—POSITION AS ASSAYER OR Amalgamator. Capable to take charge of mine and mill. Over 25 years experience. C. S. A., 1212 So. O Street, Tacoma, Wash.

WANTED.—POSITION AS ASSAYER, Amalgamator or Millman. Capable to take charge of mine and mill. Over 25 years' experience. Address ASSAYER, P. O. Box 812, Tacoma, Wash.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING OCTOBER 29, 1895.

548,797.—EXTRACTING PERFUMES—Beckett & Spencer, S. F.
548,801.—GUN SIGHT—F. W. Dobbel, S. F.
548,779.—HYDRANT—G. A. Doyle, Perris, Cal.
548,752.—ELEVATOR—J. W. Geurry, Oakland, Cal.
548,754.—DENTAL BITE CUP—A. P. Hays, Los Angeles, Cal.
548,815.—CAR FENDER—J. O'Donnell, S. F.
548,817.—DENTAL MIRROR—F. L. Platt, S. F.
548,662.—CLOTHESPIN MACHINE—P. J. Sharbach, Woodburn, Or.
548,821.—BUTTER CUTTING MACHINE—R. A. Simpson, Ferndale, Cal.
548,792.—AMALGAMATOR.—R. Wing, Butte, Mont.
549,043.—FRUIT BOX—G. D. Worswick, San Jose, Cal.
24,792.—DESIGN FOR RULER—N. L. Rigby, Los Angeles, Cal.
24,809.—DESIGN FOR BANK NOTE PAPER—F. X. Simon, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

PORTABLE ELECTRIC DRILL.—J. W. Jaimison, of Vallejo, Cal., and J. M. Edwards, of Napa, Cal. No. 547,215. Dated Oct. 1, 1895. This invention relates to a drill, the object of which is to support a driving mechanism, so that the drill may be adjusted to operate in any desired position within the radius of its operation from the support, and in conjunction therewith to employ an electric motor through which power may be applied to actuate the drill in whatever position it may be turned. It consists of a standard, and extended base slotted longitudinally for adjusting the standard along the plate, a mechanism by which the staudard is adjustably secured, clamping jaws and a sleeve which is adjustably secured therein, a yoke fixed to one end of the sleeve carrying a drill shaft and feed mechanism, a driving shaft extending through the sleeve with bevel gears, by which power from the shaft is transmitted to the drill shaft, an electric motor supported by extensions of the field magnets, said extensions having flanges formed upon them and clamps insulated from the flanges and secured thereto, whereby the motor may be clamped to the sleeve so as to change position with it, and a pinion fixed upon the motor shaft, which engages a gear-wheel fixed upon the main driving shaft, so that motion may be transmitted to drive the drill in whatever position it may be placed.

STREET CAR BRAKE.—Henry T. Atkinson, Oakland, Cal., assignor of one-half to J. E. Morris of same place. No. 548,025. Dated Oct. 15, 1895. This invention relates to improvements in street car brakes. It consists, essentially, of a standard fixed upon the car, having a cam fulcrumed thereon, a chain connecting the car with a brake rod, links fulcrumed upon or near the fulcrum pin of the cam, a brake lever extending downwardly between said links and fulcrumed to their upper ends, a link or bar connecting the lower end of the brake lever with the cam above its fulcrum pin, whereby the movement of the lever forward about its fulcrum pin causes the cam to approach the lever, and a stop or stops against which the lever carrying links are arrested when forced forward together, and a latch or pawl adapted to engage the cam and retain it in contact with the lever, so that a variable power may be employed when applying the brake, and the brake may be instantly released by reversing the movement of the lever.

SOAP BUBBLE FOUNTAIN.—Samuel H. Tracy, New York, N. Y. No. 548,477. Dated Oct. 22, 1895. The object of this invention is to provide an automatically regulated apparatus for the continuous production of soap bubbles, with means for keeping up the supply of material as fast as exhausted, means for regulating the position of the nozzle with reference to the quantity of liquid in the bowl of the fountain, and also to regulate the size of the bubbles produced, and means for illuminating the same. It consists of a receiver in which the bubbles are formed, having a self-adjusting floating air supply nozzle, a means for supplying the receiver with a solution consisting of a main and supplemental reservoir and pipes or passages connecting them with each other and with the receiver, an electrically actuated valve, a float carried upon the surface of the bubble-blowing solution and connected through the intermediate mechanism to operate the valve so that the flow from the main reservoir is controlled, and in conjunction with these devices of a hood surrounding the air pipe, over which the bubbles flow into a catch basin below, the hood having transparent openings in its surface for the passage of light and a rotary disk with colored glasses fixed around its circumference so that lights fixed below will throw varying colored lights upward through the mass of bubbles which flow down from the receiver to the hood.

CLOSET SEAT AND COVER.—Frank G. High, San Francisco, Cal. No. 548,367. Dated Oct. 22, 1895. This invention consists of a closet having two seats with openings of different diameters, and a cover; both of said seats and also the cover being hinged to turn about a single fulcrum common to them all, said cover having a groove or channel to receive one of the seats, so that the latter may be closed into it and lie flush with its lower side. The intermediate seat has extensions rearwardly to connect with the hinge joint and may be provided with a removable filling of antiseptic or other material projecting slightly above the rims or edges of the channel and extending over the metal of which the rim is made.

VOTING MACHINE.—Thomas D. Stroup, San Francisco, Cal., assignor of one-half to George Sanderson of same place. No. 548,403. Dated Oct. 22, 1895. The principal object of this invention is to provide a simple and effective locking device by which the number of keys operated can be accurately fixed so that the voter is permitted to operate that number of keys and no more. The machine consists, in connection with the keys and the registering device operated thereby, of a peculiar locking bar actuated by the keys and adapted to permit the operation of one or more of the keys, as the case may require. There are also means for actuating the locking bar to cause it to perform its function upon the operation of a stated number of keys, and means by which this stated number may be varied according to the necessities of the case. The machine has also a means, controlled by the closing of the door of the booth as a voter departs, of setting back the registering mechanism to its initial position, ready for a fresh operation.

GANG PLOW.—Owen T. Owens, Livermore, Cal., assignor to the Benicia Agricultural Works of San Francisco, Cal. No. 548,386. Dated Oct. 22, 1895. This invention relates to that class of gang plows in which the wheel, which travels in the furrow previously made, is adapted to be used at various angles to suit the inclination of the ground, and in which also the plow bottoms are adapted to be raised off the ground for transportation, and the tongue to be turned about a pivotal center to allow the horse and plow to follow the curves in the furrows. To this end the plow consists of means for connecting and adjusting the inclined wheel, means for lifting the plow bottoms, and means for swinging the tongue. These means are all of a novel character and relate to matters of detailed construction which can best be understood by reference to the patent itself.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Niedecker & Alderson, in the Bobby Burns Mine, near Placerville, El Dorado Co., to impound tailings in a ravine below the mine; from Martin Bros. in the Martin Mine, near Placerville, El Dorado Co., to impound tailings in a ravine below the mine; from Eugene Piaggi, in the Blacklock Mine, near Placerville, El Dorado Co., to impound tailings in a dry ravine; from H. E. Picket, in the Tiedman Mine, near Georgetown, El Dorado Co., to impound tailings in Marshall Canyon; from Geo. W. Davey, in the Sailor Creek Mine, near Garden Valley, El Dorado Co., to impound tailings in Irish Creek; from Mrs. Bertha Sutton, in the Jackson Creek Mine, near Cromberg, Plumas Co., to impound tailings in old pits; from Simcoe Chapman, in the Dutch Mine, La Porte, Plumas Co., to impound tailings in Rabbit Creek; from Fred Lewis, in the Lewis Mine, on Rich Gulch, Plumas Co., to impound tailings in Rich Gulch; from Fred Scott, in the Arctic Mine, near Butte Valley, Plumas Co., to impound tailings in Marian Creek; from Chas. Y. Hepler, in the Miocene Mine, near Crescent Mills, Plumas Co., to impound tailings in Sneider Gulch; from Ed. Bryan et al., in the Chaparral Hill Mine, near Saw Mill Flat, Plumas Co., to impound tailings in a dry ravine; from the Plumas Blue Gravel Mining Co., in its mine near Nelson Point, Plumas Co., to impound tailings in an old pit and on flat ground; from J. B. Higgins, in the Michigan Hill Mine, near Quincy, Plumas Co., to impound tailings in old pits and on flat ground; from Daniel Conlin, in the Pacific Mine, near St. Louis, Sierra Co., to impound tailings in an old pit; from J. M. McClung, in the Ram Creek Mine, near Brush Creek, Butte Co., to impound tailings in Ram Creek; from George Reese, in the Reese mine, near Redding, Shasta Co., to impound tailings below the mine; and from the Eureka Lake & Yuba Canal Co., in the Farrel Mine, Columbia Hill, Nevada Co., to impound tailings in worked-out pit—gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Nov. 18, 1895, at 1:30 P. M.



—EASTERN PRICES BEATEN.—

SAN FRANCISCO
Pioneer Screen Works!
JOHN W. QUICK, Prop.

Improved Facilities! Finest Work! Lowest Prices!

Perforated Sheet Metals, Steel, Russia Iron, American Planish, Zinc, Copper and Brass Screens for All Uses.

—MINING SCREENS A SPECIALTY.—

221 and 223 First Street, San Francisco, Cal.

WANTED!

A PRACTICAL PLACER MINER,

Capable of taking charge of hydraulic plant.

Address, stating salary expected, TEMPLE BAR, Kingman, Arizona.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald	455	250	25 00
M. J. McDonald, Trustee	451	2,823	282 30
Paul Lotz, Trustee	397	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Eyford, Trustee	345	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen, Trustee	346	1,000	100 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	360	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	525	4,000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

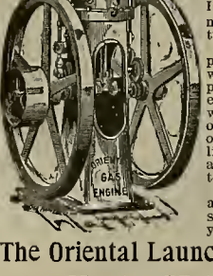
By order of the Board of Directors at a special meeting held at the office of the company on November 2, 1895, the above sale is postponed to MONDAY, the 2d day of December, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.



The Oriental Gas Engine



IS THE BEST because it combines simplicity of construction with power and economy of space.

It can be run with natural or manufactured gas or gasoline.

It can be used for pumping purposes, as well as for all purposes where a perfect engine is required, with the advantage of lessening the risk of explosions. No licensed engineer at a high salary needed to operate it.

Send for circulars and prices if a good safe engine is what you need.

The Oriental Launch is Perfection.

M. A. GRAHAM,
Inventor and Manufacturer,
105 Beale Street.....San Francisco.

WHERE

Do You Get Your Machine Work Done?

A. J. VAN DRAKE is now equipped with the latest improved machinery and tools for doing all kinds of fine machine work, large or small, Gear Cutting, Experimental work, Models, etc. Special attention given and close figures made on manufacturing new inventions in quantities.

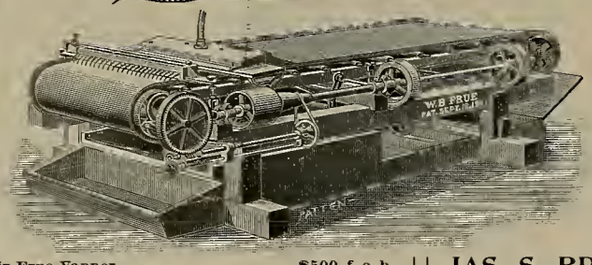
A. J. VAN DRAKE,
143 First St., - - San Francisco.

FRUE ORE CONCENTRATOR.

OVER 4200 IN ACTUAL USE.

Manufactured under Patents of

April 27, 1880;
September 18, 1883;
July 24, 1888;
March 31, 1891.
July 18, 1893.



It can be safely stated, without going into a description of several new and untried concentrators that have lately come into the market, that where sulphurets are of such value as to make close saving necessary, the Frue Vanner is always used. It is the only endless belt concentrator in the market that can be relied on to handle all classes of ores, and give universal satisfaction. (In all competition of concentrators the Frue Vanner is taken as the standard machine of the world, and all comparisons made by it. There have been over 4200 of these machines sold, 1700 having been sold on the Pacific coast alone.) They are in use in every part of the world where mining is carried on and in all cases they are giving perfect satisfaction. From time to time valuable and important improvements have been made in this machine to increase its capacity and durability, and particular attention is called to the Patent Lip Flange for the rubber belt, which does away with nearly all the strain and cracking, as in the old style of flange, making the life of belt more than double that of other style belts in the market. The lip of flange bends outward in going over the large end rolls, thereby distributing the strain in the solid rubber, and bringing virtually no strain either at the edge or at the base of flange, as is the case in all belts with a raised edge.

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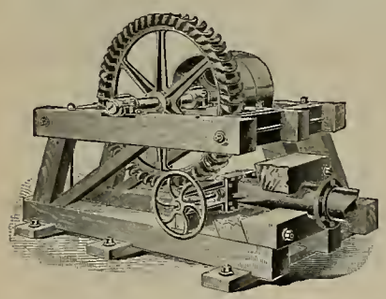
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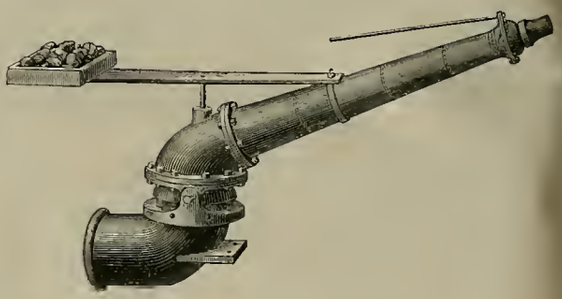
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MINING AND SCIENTIFIC PRESS.
AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 20. SAN FRANCISCO, SATURDAY, NOVEMBER 16, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

The Portland, Oregon, Power Transmission Plant.

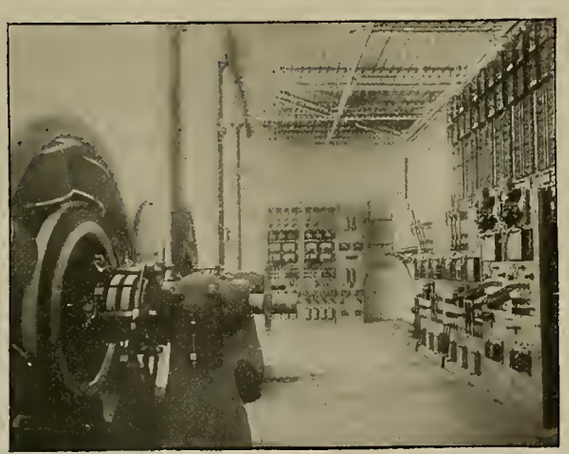
The recent electrical installation at Sacramento demonstrates the practical success of economic transmission of power, generated by the fall of water, a distance of over twenty-two miles. A recent successful electrical installation at Portland, Oregon, presents some new electrical problems which were satisfactorily solved and which are worthy of extended notice. After some delay the necessary revised data have been secured and, with appropriate illustration, are herewith produced. While the source of power in the Portland plant is but twelve miles away from the point of delivery, as compared with twenty-two miles in the case of Sacramento, yet the recent installation in the chief city of our sister State is of equal interest, as will be seen.



INTERIOR OF STATION, SHOWING THREE-PHASE GENERATORS.

The installation was made by the Portland General Electric Company, P. F. Morey, president. The company owns all the water power of the falls on the Willamette river at Oregon City, twelve miles above Portland, which, with a head of forty feet, has a minimum capacity of 50,000 H. P.

In addition to the land covered by the station, the Portland General Electric Company has purchased about 1600 acres in the vicinity. It also controls the canal and locks on the west side of the river, constructed to allow of the passage of vessels past the falls into the navigable waters above, extending seventy-five miles inland. To construct this canal the State of Oregon contributed about $200,000, the balance being supplied by the Portland company.



THE THREE-PHASE, RECEIVING SIDE OF ROTARY CONVERTERS.



THE REDUCING TRANSFORMERS IN THE TRANSMISSION STATION.

The station building is of concrete, stone, iron and brick, and when finished will have a length parallel with the river of 364 feet. The water is taken from the canal, led through an extensive hydraulic installation and discharged into the river below on the other side.

The complete power plant will consist of 20 three-phase generators, and two direct-current generators acting as exciters. The total capacity of the station, therefore, will be 12,800-horse power, divided into twenty units, each one independent of the other.

In order to obtain the best results from the power at its disposal, the Portland General Electric Company selected the three-phase system of electrical power transmission as developed by the General Electric Co., which has proved so satisfactory in the majority of power-transmission installations of varying sizes and varying distances in this country.

One peculiar feature of the Portland installation is the employment of large blocks of power for street-railway service, involving the tranformation of the polyphase current sent over the line into direct current for railway circuits. The frequency is thirty-three cycles per second, selected on account of the large amount of power which it was necessary to convert from alternating into direct current. The current is delivered directly to the line without first passing through transformers, and when it reaches Portland is transformed down to a potential of 400 volts. For the power service the step-down transformers are connected to rotary converters which will deliver a continuous current of 500 volts for street-railway service, as well as for the operation of stationary motors. Induction motors will also be used directly connected to the secondaries of the step-down transformers, when this can be done to advantage.

The generators are of special design and are set upon the floor of the station, the armatures revolving in a horizontal plane, with one bearing at the floor line and another on top of the armature underneath the collector rings. Each generator has twenty laminated poles. The armatures are a little over six feet in diameter and are about two feet high. These armatures are constructed to deliver current directly to the line at a working potential of 6000 volts effective pressure, without the intermediation of step-up transformers. On account of this high voltage numerous precautions were necessary to perfect the insulation of armature coils, to avoid leakage to the ground. The armatures are wound with flat wire and each of the coils is divided into sections, each section being separately insulated. The thoroughness with which the feat of delivering the enormous voltage direct from the machine has been accomplished can be judged by the fact that the armatures were subjected to a pressure of 15,000 volts alternating and were short-circuited and open-circuited under full excitation without the slightest injury.

The field coils are wound for excitation of 500 volts continuous current and each has been subjected to a test of 5000 volts alternating. The regulation in these machines has proved singularly good, the increase from no load to full load being comparatively moderate.

The exciters are set up to allow of the armature revolving in a horizontal plane with one bearing only at the floor line. The construction of these exciters is almost identical with the G. E. M. P. type of railway generator, and each has a capacity of 250 K. W. at 125 revolutions per minute.

(Continued on page 324.)

MINING AND SCIENTIFIC PRESS.

ESTABLISHED 1860.

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J. F. HALLORAN.....General Manager

San Francisco, November 16, 1895.

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HOLDERS of mining claims have only forty-five days more in which to do the required $100 worth of work or improvements for '95.

THE Chicago Stock Exchange, by a majority vote, has decided not to establish a mining stock department. The spirit existing there will be the probable result of a Chicago mining exchange.

BY granting permission to the MacArthur-Forrest patent owners to amend their original patent, the English courts have given additional strength to their position. It is evident that litigation on that subject is over in England.

A RECENT COLORADO DECISION in the Rico-Aspen case is important in its bearing on the rights of tunnel site locations, to the effect that such locators cannot cross prior lode locations without consent, and cannot claim lodes discovered within the lines of such locations.

"IS AN American Mining Boom in Sight?" is the title of a three-column article in *Bradstreet's* of Oct. 26. A "boom" is unlikely and undesirable, but it is manifest that there will be an unprecedented era of mining activity in this State, and everywhere else where gold can be secured at less than the cost of production.

SPECULATION is usually indulged in with spare capital. The present speculative South African mining share investments in England and France illustrate the great amount of idle capital in those countries. Legitimate mining as in this country has become as sure a business investment as any form of placing money for return can be.

IN some silver districts, notably in parts of Utah, the year's operations show a tendency to consolidate small silver-producing properties. With increasing economy in mining methods and the saving in management and expense afforded by intelligent consolidation, it is probable that idea will spread. Other industrial enterprises are consolidating and cutting down expenses in a struggle for continued existence, and the abiding shrinkage in the price of silver makes necessary such action on the part of the silver miner.

COLLAPSE of the South African mining bubble seems imminent. It was only a question of time, no country being able to stand such excessive speculation. The rich gold mines of Johannesburg, or the Rand, will not suffer by the cessation of extravagant schemes. There are forty-five gold-producing companies in that one district, and their output and profit are, of course, unaffected by the ephemeral and meretricious stock operations of the past year.

That Constitutional Amendment.

One year ago the voters of this commonwealth affirmed a proposed constitutional amendment, which changed Section 17, Article I, to read as follows:

SECTION 17. Foreigners of the white race, or of African descent, eligible to become citizens of the United States under the naturalization laws thereof, while bona fide residents of this State, shall have the same rights in respect to the acquisition, possession, enjoyment, transmission and inheritance of all property, other than real estate, as native-born citizens: provided that such aliens owning real estate at the time of the adoption of this amendment may remain such owners: provided, further, that the Legislature may by statute provide for the disposition of real estate, which shall hereafter be acquired by such aliens by descent or devise.

Ever since have come continual inquiries from England as to the effect of the above on British ownership of California gold mines. The matter has received considerable notice in these columns, the comment having been somewhat widely reproduced, but it appears that doubt still exists as to the interpretation of the amendment. The question was referred to the Attorney-General of the State, who officially stated that the resident alien is secured by the Constitution in the particular privileges enumerated in the amendment, and may be secured by the Legislature in as many more as it chooses to give; that no existing rights are interfered with, and no law can be enacted abridging the constitutional rights of resident aliens.

Neither in letter nor spirit is there any intent to militate against the acquirement of real estate in any form by foreigners, and any "warning" promulgated in Europe or elsewhere must be ascribed to other motives than desire for the public good.

The federal law on this subject was passed by Congress in 1887, and is as follows:

It shall be unlawful for any person or persons not citizens of the United States, or who have not lawfully declared their intention to become such citizens, or for any corporation not created by or under the laws of the United States, or of some State or Territory of the United States, to hereafter acquire, hold or own real estate so hereafter acquired, or any interest therein, in any of the Territories of the United States or in the District of Columbia, except such as may be acquired by inheritance or in good faith in the ordinary course of justice in the collection of debts heretofore created; provided that the prohibition of this section shall not apply to cases in which the right to hold or dispose of lands in the United States is secured by existing treaties to the citizens or subjects of foreign countries, which rights, so far as they exist by force of any such treaty, shall continue to exist so long as such treaties are in force, and no longer.

The above is simply published as a matter of current information asked for, and is not a subject of present comment.

In relation to the passing of a patent, the following is of collateral interest to the general subject, being the last legal utterance on a question asked in general connection with this matter of alien acquirement of mining property. It is from a decision by the Supreme Court of the State of Colorado, the case being the Justice Mining Co. vs. Lee, and is taken from 40 Pac. Rep., 199:

The grant of a patent to a mining claim from the United States to one who procured it for and assigned it to an alien is the judgment of a special tribunal, and cannot be collaterally attacked. While it is true that the mineral lands of the government are open to location and purchase only by a citizen of the United States, or one who has declared his intention to become such, and the fact of alienage, if raised at the proper time by any one adversely interested, will defeat the acquirement of title, yet the qualifications of an applicant for a patent, as well as the fact of discovery, and the compliance on his part with other requirements made essential by the act of Congress to entitle him to purchase the mineral land of the government, being cognizable by the officers of the land department, when, in the exercise of their jurisdiction, they approve the application, and allow an entry, the fact of citizenship, as well as all other questions of fact, is presumed to have been established, and is not open to review by the courts at the instance of third parties.

RECENT continued and expensive litigation in the case of the Waterloo Mining Co. vs. J. S. Doe emphasize the necessity for care in the marking of mining locations. The boundaries of a mining claim, its exact location, are matters of essential primary record. Any carelessness in this regard will surely make trouble in case the mine proves valuable. The general direction of the vein should be determined in marking the surface boundaries, on the records should appear the course and distance from the discovery shaft to some prominent or presumedly permanent object to secure sure identification. The names of adjoining claims or relative position of contiguous claims should appear. A suitable post or monument should be placed at each corner of the surface ground and at the discovery point should be placed proper designation of the name of the lode, names of locators, number of feet claimed and in what direction. When filed for record, the notice of location ought to give all the foregoing and state if the 1500 feet is on one side of the discovery shaft or point or on two sides; and, if so, how much is claimed on each side. The utmost care is requisite throughout, and, as it doesn't cost any more to have it done right than to have a faulty record, it is best to exercise considerable effort to have the marking, description, surveying and recording done with such exactness that, if any error is made, it is on the safe side, and too much done instead of too little.

THE legislative committee of the Cal. Miners' Association has drafted a bill, to be presented at the coming session of Congress, creating a mineral land commission for this State, similar to that now in existence in the States of Montana and Idaho, except that its membership shall be made up of actual residents of this State, at least one of whom shall be a practical miner. H. R. 8551 of similar wording and intent lacked favorable Congressional committee report last January. It is to be hoped that affirmative action may be had on the proposed bill during the coming Congressional session. There are two or three measures of vital importance to the miners of this State that will be before the National Legislature this winter and that will need united and continuous effort to get through.

SCIENTIFIC PROGRESS in mining appliances has had much to do with the increased gold output. As the country becomes more thickly populated an increasing proportion of the population will turn to mining for investment and livelihood; the improvement in methods and the present efficiency of machinery and the reduction in cost of supplies making possible a profit in many localities where similar operations would heretofore have occasioned a loss. In mining, as in other lines of industry, science is organized knowledge, and is essential to progress or success. Such a plant, for instance, as that at the Standard Con. at Bodie, or now building at the Merced properties in Mariposa Co., or just completed at the North Star, Grass Valley, would have been impossible a few years ago, and the accruing results equally impossible.

RANCHERS in the Okanogan, Washington, country, recognizing the value of a cash local market, are organizing to get and retain control of the Kootenay, B. C., mine trade. Ranchers in some parts of California, not realizing the value of such a market, contribute toward keeping up an organization whose avowed purpose is to destroy their own best market, meanwhile writing letters of complaint that the price of their product is so low, while they appropriate a part of their poor earnings to keep that price down to the present pittance. The California miner is to-day the best cash customer and the best business friend of the California rancher, and when our agricultural brethren realize this, and break away from the demagogues, the agitators and others who live off their earnings and find employment in making and maintaining strife, it will be better for all.

WHEN application to the United States Debris Commission for a hydraulic permit or permission to construct a dam for the impounding of debris is granted, it is with such conditions and limitations as without unduly hampering the recipients make it certain that all the requirements of the law shall be fulfilled, and, in all cases, traveling deputies of the Commission who inspect the work make almost impossible any evasion or violation of the law. One of the largest of such dams is now being built by the Milton Co., employing forty-five men at the Manzanita mine, Sweetland. The base of this dam is over 300 feet; when completed, it will be 150 feet in height. A mile of flume has also been built. The best evidence of the utility of this part of the United States Debris Commission's duties is afforded in the fact that of the number of dams built under the operation of the present law not one has failed to fulfill the conditions under which it was constructed.

Concentrates.

THE altitude of Cepperopolis is 1132 feet.

THERE are now forty-five States in the Union.

"A STATE MINING COMMISSION" is suggested in Nevada.

THE Trinity Co. quicksilver mine last week shipped 404 flasks.

THE California Miners' Association has liquidated all its indebtedness.

TO DATE the dividends of the Boston and Montana Co. aggregate $3,425,000.

J. C. WILLIAMS has a tunnel in 1600 feet at the Golden Drift mine, Magalia, Butte Co.

SIERRA COUNTY miners have sent the State Mining Bureau a relief map of that county.

THE Bellevue, Oregon, mine is reported bonded to the Standard Oil Co. for $200,000.

LAST SATURDAY the Silver King, Utah, Mining Co. paid its regular $37,500 dividend—a total of $412,500 to date.

THREE 50-ton water-jacket furnaces have resumed operations at the Old Dominion copper mine, Yuma, Arizona.

OPERATIONS at the Linderaxa mine, in Calaveras Co., have been suspended so far as the present company is concerned.

THE Lowry gravel claim, near Aqueduct City, Amador Co., is to be worked on a large scale by the owners, Meehan & Co.

THERE are 400 people in the Picacho, Cal., mining district, supported wholly by the placers of that region, crudely worked with dry washers.

AN army of miners, numbering considerably over 50,000 men, is now busy at the first annual assessment work required in three years.

THE superintendent of the Tacoma, Wash., smelter reports an October product of 1710 ounces gold, 33,761 ounces silver and 408,762 pounds lead.

JNO. THEISEN is working on an electric process to reduce the ore and separate the gold and silver from the copper at the Cosumnes copper mine.

THE Gem mine, Wallace, Idaho, closed down last week, throwing 100 men out of work. It is expected operations will be resumed next spring.

COMMISSIONER LAMOREAUX of the General Land Office has approved the selections and classifications of the Montana mineral land commissioners.

THE Tuolumne *Independent* says a twenty-stamp mill will soon be built at the Golden Gate mine. The ten stamps now in use were found insufficient.

HUTTON AND MOTHERWELL, leasers at the Brown Bear, Deadwood, mine, cleaned up $3800 from seventy-five tons of ore, the work of two men for five months.

THE chief gold fields of South Africa, Barberton and the Randt, are not on British territory but in the South African Republic, better known as the Transvaal.

IT is true that up at Forty-Mile Post, Alaska, wages are $10 a day, but when one considers that a man can only work 30 or 40 days in the year it isn't so big after all.

THE case against the North Bloomfield Mining Co., for failure or refusal to make application for a hydraulic permit, has been taken under advisement by Judge McKenna.

THE French Gulch correspondent of the Redding *Searchlight* says the Niagara's good fortune continues, sufficient good ore having recently been struck to keep the mill going for a year.

ILLUSTRATING the great profits of legitimate mining, it is calculated that the net profits of the Anaconda, Mont., copper mine for the eighteen months ending June 30, '95, were nearly $5,000,000.

NELLIE CASHMAN, famous in many mining camps, is in Tucson, Arizona. She was foremost in several "booms," and was long considered a mining mascot, her arrival and sojourn being looked upon as indicative of success.

THE largest reservoir in Idaho is that of the Salmon Gold Mining Co., just completed at Salmon. It is 350 feet long, sixty feet high, and it is estimated to hold sufficient water to successfully works thirty acres of placer ground.

ABOUT forty-five men are finishing the big debris dam building by the Milton Co. at the Manzanita mine, Sweetland. The company formerly operated at French Corral, and expect equally as good results from the Manzanita continuation.

C. M. LANE, who recently bonded for $150,000 the La Fortuna group of mines, sixteen miles south of Yuma, Arizona, in the Gila mountains, says if continued development proves the mine to be what it now promises his firm will build a mill.

THE once prosperous mining camp of Pioche, Nevada, is nearly deserted, there being only a few leasers at work in the mines and some assessment work being done. There are good properties there and need only capital to develop them.

CHOLLAR has levied a 25-cent assessment; the Standard Gold and Silver Mining Co. of Butte county has levied a 3-cent assessment, delinquent December 7; the Carson Creek Mining Co. has levied a 50-cent assessment, delinquent December 10.

THE Raven Tunnel and Mining Company, on Raven Hill, at Cripple Creek, Col., has sold its property for more than $400,000 to C. G. Hathaway, Eben Smith and D. H. Moffatt. One of the mines of the company is the Raven, which has produced over $200,000.

THE Buchanan Mining Co., near Sonora, Cal., proposes to build a dam in Hunter canyon and put in an electric plant there. It is their further intention to work the Hunter mine in connection with the Buchanan. P. J. Sullivan is the secretary of the company.

THE Lance Mining Co. has incorporated at Medford, Or.; J. W. Odgers, A. N. Berlin and C. J. Hall, incorporators; capital stock, $60,000. The company has bonded 700 acres of placer ground in Foots Creek district, and will commence to develop the property.

TWENTY-SEVEN placer claims near the head of Grande Ronde river, thirty-seven miles northwest of Baker City, Or., including 540 acres, have been bought by the Grande Ronde Placer Mining Co., a Paris, France, organization, for about $50,000. Thos. Markum of La Grande, Or., is the superintendent and manager. Extensive improvements will be made this season. A local paper says $10,000 has been placed in the La Grande bank as a starter.

PUMICE-STONE MINES are something new, the commercial supply heretofore coming from Europe at a cost laid down of nearly $100 per ton. T. B. Crocker has a mine of pumice-stone in Utah, 200 miles south of Salt Lake, and says he can furnish it in unlimited quantities.

THE Pioneer Reduction Works of Nevada City now use crude petroleum as fuel, receiving tank cars of 5000 gallons each week from the Union Oil Works at Santa Paula. The oil is drawn in 100-gallon tanks at Colfax for shipment over the Narrow Gauge railway.

THE Virtue mine, near Baker City, Or., sent to that place a $13,000 clean-up, the result of less than a month's run. An electric-light plant, an air compressor and a large pump have just been added to the property. A great deal of development work was done last month.

AT the Jones mine, on Carson creek, near Angels, a twenty-foot ore body is reported on the 400-foot level, of extraordinary value. Twenty stamps are to be added to the forty already there. A. D. Remington, of Watertown, N. Y., recently acquired an interest in this property.

THE Chloride Hill Mining and Milling Company has incorporated at Davenport, Wash., to develop and explore four mining claims in Stevens county, in the vicinity of the Cleveland and Deer Trail No. 2. The principal place of business will be at Davenport: capital, $384,000.

DURING October the Standard and McGill quartz mine near Greenville, Plumas Co., produced $14,000, $10,000 of which was profit. The owners contemplate building a mill in the canyon below the mine. So far they have had the ore crushed by 15 stamps at the Kettle mill, one-half a mile from the mine.

HAVING acquired many of our California miners, the South African people now reach out for education in other branches, and advertise for primary school teachers, to whom they offer $800 per annum for three years. So far as California is concerned, the inducements in this case do not appear to be sufficient.

THE U. S. Debris Commission last Monday granted hydraulic mining permits to N. C. Tully, owner of the Omega mine, near Washington, Nevada Co.; W. A. Morse, owner of the Muggensville mine, and Henry H. and A. A. Mayer and John Costa, owners of the Argentine mine, near Downieville, Sierra Co.

THE Golden Bar Steam Dredging Co. has incorporated at Cheyenne, Wyoming. The company has secured a thousand acres of gravel bars along Snake river in the Jackson's Hole region, and will place two large steam dredges at work on the property early in the spring. The ground has been tested and is said to be rich in gold.

THE bond on the Congress mine entered into two years ago by an English syndicate expired on the 1st. It is said that an extension of the bond will be given and that representatives of the syndicate are now en route from Europe. The new bond is reported to be for $3,000,000. The mine belongs to the Diamond Joe Reynolds estate.

IN southern Oregon 25 men are employed at the Illinois river copper mines at present. The smelting plant has been hauled in over the four-foot grade built from Deer creek, and preparations are being made for roasting ore, about 500 tons of which lie on the dump. The company will put a wire suspension bridge across the Illinois river.

A CHINESE STOREKEEPER of Honolulu, Siskiyou Co., is the principal owner of the Benz Bar claim at Klamath river, employing forty-four men, some of whom are Caucasians. He says his countrymen don't want any more mining claims, as no young Chinese can come to this country, and those now here are too old to open any new claims.

THE report of the directors of the Montana Mining Co. of Marysville, presented at the meeting in London, October 31, covers the operation of the company for the half year ending June 30, 1895. The receipts for that period were $397,617; the total expenses, $297,719. A new Reidler pump was installed during the six months at an expense of $23,000.

ABOUT a year ago Jno. S. Doe brought suit against the Waterloo Co. for possession of the Red Jacket mine in San Bernardino Co., alleging that the original location had not been properly made. Judge Ross of Los Angeles decided in favor of the defendant company. On appeal, the U. S. Circuit Court in this city last Saturday affirmed Judge Ross' decision.

DURING the year ending September 30th, 1895, the Eureka Con., at Eureka, Nev., shipped to Salt Lake 1500 tons of ore and 11 tons of jiggings from the furnace dumps, extracted on the tribute system, all the work in the mine having been performed by tributers excepting the timbering, tracking, etc., that was necessary to keep the main levels and shaft in condition.

ON the 5th the Schroeder quartz mill on Deadwood mountain, nine miles south of Yreka, was destroyed by fire, including machinery, part of the tramway, and all the buildings except the old boarding house and the stable. This mill was one of the best equipped in northern California, having improved quartz machinery, and was valued at over $30,000, upon which there is an insurance of $15,000.

ELECTRICAL progress and efficiency emboldens swindlers to flood the country with plausible statements of unworthy schemes called "electric." Sometimes the "invention" is represented to cure disease, sometimes to prevent it. A Boston Co. is now trying to take the census of the fools in the country by advertising an "electric mine indicator," a sort of divining rod or dousing stick scheme.

A RECENT legal decision regarding mineral locations is to the effect that an application may embrace several locations. Conflicting rights set up to defeat an application cannot be recognized in the absence of an alleged surface conflict. In the absence of a clear showing as to possessory right, patent must be denied. Survey must be made by actual measurement on the ground.

AT Thompson, Mont., the Montana Antimony Mining Co. is working a 15 per cent antimony ore, with a small furnace and concentrators, and figures cost of mining $5 per ton; concentration, $1.20; refining, $3; shipping, $3; total, $12.20 per ton, leaving a net profit of $11.80 per ton. With better facilities the company claim they could get the entire cost down to $8.50 per ton.

AT Salt Lake, Utah, the Germania Smelting Co. claims to have reduced the cost of roasting from 60 cents to 28 cents per ton. The new roaster is of the Keller patent and is the only one in the Territory. It is a continuous furnace; the application of the flame is regulated so that the fire is controlled on any one of the different platforms which go to make up the roasting capacity of the plant.

A VIRGINIA CORRESPONDENT of the Genoa *Courier* claims to be possessed of positive information of "a single body on the 1600-foot level of the Consolidated California and Virginia mine that is good for ten or twenty years. It is cut by a crosscut 160 feet in width on that level and about 300 feet in length and extends two or three levels up and down on the slant of about 45 degrees and will average $8 or $10 a ton."

THE North Star works, on Massachusetts hill, Grass Valley, are about ready to begin operations. A full account of the plant appears on page 130 of the issue of August 24, '95. The constructing engineer estimates the expense for power will not exceed $36 per H. P. per annum. Pumping out the old Rocky Bar mine through the Brennan shaft will begin about January 1st, '96. This will necessitate the drainage of nearly the whole of Massachusetts hill.

TWO SALT LAKE men have secured a patent on a traction engine which is especially designed for the transportation of ores from the mines that lie distant from the railroads. It is understood it is to be given a trial by one of the big mines of Utah. It is different from any other traction engine in that it is equipped with a sort of rolling track eight inches wide, within which the drive wheels revolve. Its capacity is 100 tons at from six to fifteen miles per hour over ordinary roads.

H. W. BLAISDELL of Yuma has bought the Warrington and Little Angel mines at Havilah, Kern Co., for $5000, and proposes to sink a 300-foot shaft. The Ophir, May, and the two Canty mines are reported sold to G. Roher of Pomona and H. Mead of Los Angeles for $10,000. J. C. Coulston of Erskine Creek has bought the Rochfort, near Havilah, for $2500; Ezzell, Patterson and Gillis have bought the Portuguese mine, on Kern river, six miles from Havilah, for $3500.

GEORGE MORRIS, express agent and assistant postmaster at Chinese Camp, was shot and killed by two robbers last Saturday. Five thousand dollars in coin had been shipped from Oakdale to Angel's Camp. In changing horses for the stage at Chinese Camp the express agent took charge of the money until the stage came back from the stable. The robbers ordered Morris to throw up his hands, but in place of doing so he shot at them. One of the men, who had a shotgun, returned the fire and riddled Morris' body with buckshot. They fled without taking the money, and Morris died three hours later.

THUS says the Spokane, Wash., *Chronicle:* "The occasional kicker who growls because 'England is buying up all our mines' doesn't know what he is talking about. England may keep on buying mines in this northwest country for the next twenty years, and still we will have plenty to sell. As a rule, every time these British capitalists pay a few hundred thousands for a property a good share of the new money should find its way back into the same or a neighboring district to develop a couple of prospects into mines just as good as the first. At the present rate of discoveries England will need to mortgage India and put Ireland up at auction if she intends to buy all the mines that can be developed within a couple of hundred miles of Spokane."

IN the case of Morse vs. Deadro the Supreme Court of this State decides that, "independent of the acts of Congress providing a mode for the acquisition of title to the mineral lands of the United States, the term mining claim has always been applied to a portion of such lands to which the right of exclusive possession and enjoyment, by a private person or persons, has been asserted by actual occupation, or by compliance with local mining laws, or rules, or customs. The words 'mining claim' as used in the law have no reference to the different stages in the acquisition of the government title. In our opinion it includes all mines, whether the title is inchoate, as in the case of a mining claim in its strict sense or perfect as in the case of a fee simple title."

THE following from the New York *Mail and Express* of the 13th is reprinted simply to indicate the feeling in the East. The *Mail and Express* is a conservative journal, usually free from sensationalism: "Clarence Mackay, who arrived last week, went back to Europe to-day. Mr. Mackay Sr. is busily engaged in closing up some large mining contracts and cannot be absent from America for any length of time just at present. It is stated this astute mine owner looks for a revival of European interest in American gold-mining properties as a result of the late Kaffir craze in Europe. Fortunes made in that excitement, which are already beyond the power of any panic to touch, are so numerous that it is hardly to be supposed mines elsewhere which are better than a majority of the Kaffir properties, will fail to come in for a share of attention from this large class, which knows what a good mine is. With new methods of working and superior facilities for transit offered by American properties, we ought to have a gold-mining boom with which the Comstock excitement of the '70s would look like a microbe beside a mammoth."

DISCUSSING the Montana Co.'s report, the London *Mining World* of October 26 makes some editorial remarks which illustrate the feeling in some British minds. It says: "With such litigation as the Montana has just successfully contended, English shareholders who hold good mines in the United States are not unfamiliar. This probably is one of the reasons making it most difficult to float an American mine on the English market. If the mine prove a bad one (and most of them do that come from America), then the English shareholders are left to work it at their loss, and if it prove a good one, then a lot of trumpery claims are set up against its title. This was the case with the Richmond, and oceans of money were spent in law that might have been divided amongst the shareholders. It was also the case with the Flagstaff in its palmy days, and it will be the case with other American mines if English shareholders put their money in them and they turn out to be profitable." It would be difficult to compress more prejudice and unfairness into a paragraph. Even the Nevada and Arizona mines mentioned in no way justify the untenable conclusion. The excerpt shows the truth of the assertion that the mind of a bigot is like the pupil of the eye; the more light you pour upon it the more it contracts.

The Sampling and Measurement of Ore Bodies in Mine Examinations.

NUMBER IV.—*Concluded.*

By EDMUND B. KIRBY.

Rapid approximate methods are frequently used for preliminary estimates, or to check the results of detailed measurement and sampling, or to determine probable ore, or in estimating the chances for further discoveries, etc., etc.

Sometimes the conteuts of an ore shoot or body are estimated from the average yield per unit of area or length of other portions already worked.

Again, a continuous sheet of ore is sometimes so intersected by mine workings as to expose and prove the sheet within the area bounded by a line circumscribed about these workings. It may then be unnecessary for the purpose in view to estimate each block separately. The entire area which is considered proven is measured as a whole, and the number of square feet of vein area excavated by the workings is also measured and deducted. From the total yield of the area already worked, that of the remaining portion may oe calculated.

When this quick method is applied with judgment, to the proper conditions, aud the actual figures of production are knowu with *certainty*, its results agree very closely with those of detailed measurement and sampling, and are often used to check them.

Dumps are measured by ordinary cross-sections, but since they are generally on an inclined hillside, it is not always convenient to measure from the horizontal base plane of an instrument. A string or line of sight between the two poles is often preferred, and is accurate enough for the purpose. Irregular sections are always plotted.

THE REDUCTION OF VOLUME TO TONNAGE.

This is done by using the factor of cubic feet per ton for the ore in question. This factor is derived in two ways:

1. This method is applicable only to ore composed of simple minerals or simple rocks or their combinations in known proportions. A safe margin is always added to the theoretical result because the standard specific gravities given are the figures for pure, dense, crystallized specimens, while in ore deposits the minerals are often more or less altered and somewhat amorphous and porous.

The following table gives the calculated figures for these minerals and rocks of which ores of the precious metals are mainly composed. The first columu is the theoretical result, calculated from the average specific gravity, and the second gives a general figure for practical use:

NUMBER OF CUBIC FEET PER TON.

MATERIAL.	Number of Cubic Feet of Solid Material in Place, Per Ton of 2000 Pounds.	
	Theoretical Figure Calculated from the Average Specific Gravity. (For Pure Unaltered Specimens.)	A Figure for Practical Use.
Galena	4.3 cu. ft.	4.7 cu. ft.
Pyrite	6.4 "	7.0 "
Blende	8.0 "	8.5 "
Hematite	6.6 "	7.5 "
Limonite	8.4 "	9.4 "
Dolomite	11.4 "	12.5 "
Limestone, Andesite, Syenite	11.9 "	13.0 "
Vein Quartz, Granite and Granitic Rocks	11.9 "	13.5 "
Clay, Quartz, Porphyry, Trachytes, Rhyolites, etc.	12.3 "	14.5 "
Vein Quartz, with 15% Galena	10.7 "	12.2 "
Vein Quartz, with 15% Pyrites	11.1 "	12.5 "
Vein Quartz, with 10% Hematite	11.4 "	12.9 "

Figures thus assumed from calculation are always applied with much caution aud jugöment, because wheu rocks are so impregnated as to become ores they are generally full of small fractures and may be spongy or porous. The figures for practical use are calculated from the minimum specific gravities given by the authorities, with an addition of about 5% for variations, crevices, cavities, etc.

2. Oxidized ores are generally amorphous, loose and porous, and cannot be calculated. Their volume is therefore determined by practical test by any of the following methods:

In a thin sheet the ore may be stripped and several tons broken down and weighed, after carefully measuring the thickness and area broken down to determine its volume.

In a mass of ore the writer has used the figure obtained by carefully stopiug the right rectangular prism to be filled by one "square set" of timbers.

The determination is made on a small scale by filling a bucket, tub, or box, of measured volume with weighed, coarsely broken ore, and then pouring in water level with the top of the ore. The total volume occupied is then measured, the water is poured off and its volume measured; the difference being the volume of the solid ore. Occasional determinations of this kind on various ores soon make it possible to select a safe factor in most cases by judgment, since the principal object is not scientific accuracy but safety.

Loose ore piled on dumps in pieces from head to gravel size will have from 35% to 50% of interstitial spaces, the percentage being greatest if the lumps are somewhat equal sized. Thus a dump with 40% of spaces, and composed of ore averaging 12.7 cubic feet per ton in place, will measure 21.2 cubic feet per ton.

ESTIMATE OF THE TOTAL NET VALUE.

The net profit, or *net value* of the ore measured aud sampled is generally figured by the ton, either by a separate calculation for each individual block, ore body, or shoot, or by one calculation for the entire mine. Conditions are generally uniform enough for the latter plan. The tonnage of ore measured is only what will be actually broken down. The sample assays represent this measured ore as it will be when broken, and before it is sorted, either under or above ground.

The methods of calculating the net value of this ore from these data vary with every case, but their details are not of interest here. It is, however, necessary to call attention to the four principal factors which usually enter the problem, aud the variations in calculatiug each factor.

THE FOUR PRINCIPAL FACTORS COMMONLY USED IN MAKING ESTIMATES OF TOTAL NET VALUE.

I. *Gross or Assay Value* per ton. This is always figured on the "ore broken," and from the assays and analyses. It is either:	1. *Full Value*, according to N. Y. quotations for the valuable metals contained. 2. *Partial Value*, with various losses, expenses and deductions subtracted here.
NOTE:—The assay value of various products from the ore broken is often required, such as: (This is determined by calculation or by special tests.)	1. *Ore Milled*, after some sorting. 2. *Sorted Ore Shipped.* 3. *Concentrates.*
II. *Losses* (to he deducted from the assay value) are either expressed per ton, or as a percentage of the "assay value." They comprise either:	1. *All the Losses.* 2. *Part of the Losses*, remainder being placed in I or IV.
III. *Tonnage* used is either:	1. *Ore Measured*=ore broken. 2. *Ore Hoisted*=the ore broken; often after it has been reduced somewhat by underground sorting. 3. *Ore Shipped*=the ore hoisted; generally after it has been further reduced by sorting on the surface. 4. *Ore Milled*=either the ore hoisted, or this reduced by further sorting.
IV. *Cost*, per ton, may he figured on either of the above tonnages or on that of the products, such as concentrates, etc. It includes both:	1. *Cost of Mining* — Including general expenses and "development" only so far as they are required for extraction of the blocked ore "in sight." 2. *Transportation and Treatment.* Some of the losses and smelter deductions from assay value are often included here.

It is to be noted that each one of these four terms is meauingless unless accompanied by a full explanation of how it is figured.

In estimating losses on milling ore it is not often safe to deduct a given percentage, but the loss should be expressed by a definite number of dollars per ton. The reason for this is that the loss in such ores is generally quite constant, and bears little or no relation to their original contents.

The accuracy with which a sample is made to represent its liue should be somewhat proportioned to that with which this line represents its area, and the area its volume. At the same time, since the limit of error in the sample is controllable, it is kept much less than the possible errors of area and volume, which are fixed by the conditions of the mine.

The possible error in the estimate of a block must be provided for iu one of two ways. If there are a number of blocks uot differing greatly in value, their errors will balance according to the probability of averages. If there are but few blocks, or the value of some one is so great that its possible error will be a large perceutage of the final total estimate, a safety deduction is made to cover this possible error. The necessity for this deductiou and its amount are matters for experienced judgment. Probably every one engaged in this work has had occasion to notice the danger in an estimate of ore in sight, based upon a siugle block, the variatious of which are not balanced, and in this case a liberal deduction is often necessary for safety.

Fraud in some form, generally from salting samples, is a danger often possible, and every engineer devises his own private system of safeguards, but no system can do away with the necessity for constant care and vigilance.

Notes on Gold Milling in California.

NUMBER I.

By E. B. PRESTON, M. E., Field Assistant State Mining Bureau.*

The system of reduction of gold-bearing ores with stamps, as at present carried out in California, is the result of progressive improvement during the past forty-four years. The first successful mill in this State was built in the winter of 1850–51, and used steam for power.

Starting with the ancient Mexicau arrastra, crushing, with the help of a mule and one man, a few hundred pounds of ore at a charge, we have progressed to the present aggregation of mechanical appliances, as seen iu the modern stamp mill, requiring great motive power, aud disposing of hundreds of tons of ore iu the course of a day. This progression is largely the result of accumulated practical experience on the part of the designers and builders of mills, as well as of the millmen in the handliug of the various gold ores. Of late years scientific investigations have greatly aided in improving both the process and the mechanism.

That the results accomplished have been of economic value is evident from the fact that while formerly a yield of 30 to 40 per cent of the total gold in the ore was the average obtained, the best mills of to-day are able to more than double these figures. That our methods may still be improved upon, and the margin of wasted gold be further narrowed down, is the point for which all intelligent millmen are striving. While the stamp mill itself had been used for crushiug ores long before the discovery of gold in California, since that time it has been greatly improved in detail, and its capacity and efficiency increased, hence what is known as the "California gold mill" is a very different affair from the clumsy mills first used for crushing quartz in this State. The California gold milling processes and the California millmen are, as a result, finding due recognition outside of their own immediate field of operation, as is evidenced by the increasing outside and foreign demand for our men and milling machinery. The development of the milling process, keepiug pace with the improvement of the machiuery required for ore reduction, has had the beneficial effect of greatly lessening the working expenses, permitting ores of a low grade to be worked at a profit. California has a great abundance of this class of ores, comparatively untouched, and these must be mainly relied ou in the future as the sources of the precious metal. Already, under extremely favorable conditions, ores are being mined and milled in California at a cost of 50 cents per ton, as at the Spanish mine, in Nevada county, where, with Huntington roller mills, ores yieldiug 85 ceuts per ton have been worked at a profit.

When assured of a constant and sufficieut supply of ore, it is of the greatest importance that the site for the mill should be chosen with due regard for economic treatment. This necessitates the observance of the following points: The means of transportation of the ore from the mine to the mill, which should be done automatically, or at least with as little handliug as possible, conveying the ore at once to the highest point in the mill, so that it will descend by gravity from one to the other in all the different consecutive operations. Another important feature is to provide sufficient space for capacious ore bins, which are necessary to prevent a stoppage of the mill through a lack of ore, caused through unavoidable delays iu the mine or along the roads. The accessibility of the mili site as regards fuel, water, or electrical transmission, according to the motive power to be used, and their continuity and cost at all seasons of the year, must likewise be considered. The possibility of placing the levels for the different floors on solid rock foundations should be investigated, as stability of the machinery is most essential for successful milling.

The ideal site would be to have the mill in close proximity to, but below the level of, the collar of the shaft or the mouth of the tunnel, on sloping ground, where the ore can be delivered directly from the mine to a "grizzly" on the upper floor of the mill, to be passed later, without rehandling, through the crushers, ore bins, self-feeders, mortars, etc., while leaving sufficient space for a waste dump. For a mill arranged in this manner, including concentrators and canvas platform, 40 feet of fall should be available. If chlorinatiou works are also to be used, a greater fall is desirable.

After deciding ou a suitable site, the surface should be removed down to the bedrock aud leveled off for the different floors. Solidity and accessibility are the chief points to be observed in placing the different parts of the mill. Where required, heavy stone walls should be erected as buttresses. The foundation for the mortars and the proper erection of the battery frames are points requiring particular attentiou. For the mortar block a trench is prepared of suitable depth, preferably in solid bedrock, proportioned to the height of the block, and wide enough to leave about 2 feet of free space around

*Bulletin No. 6, California State Mining Bureau.

it, which is later filled in with concrete or tailings from the battery. These mortar blocks vary from 8 to 15 feet in length and are dressed at the upper end to the size of the bed plate of the mortar. In California they can be obtained frequently from a solid cut of a pine tree, or else consist of two or three sawed blocks fitted and bolted together; but where clear timber of the requisite size is difficult to obtain the block can be constructed of 2-inch plank, as is done in the Black Hills in Dakota. There the bottom of the trench for the block is leveled and some sand tamped down, on which two layers of 2-inch plank are placed crosswise and spiked to each other, and made perfectly horizontal. On this foundation a mortar block is constructed of 2-inch planks, from 11 to 14 feet long, according to the depth of the trench. The planks, which should be of clear lumber, and varying breadths (in order to break joints), stand on end, with their width parallel to the long side of the mortar. They are spiked together and fastened above and below with binders and bolted to each other by transverse rods; the upper binders (8x12 inches) being even with the top of the mortar blocks; the lower binders (12x12 inches) are 3 feet lower.

The top of the mortar block should be planed perfectly true and leveled, and where several blocks are placed in line all the blocks should be sawed off to one height. Before setting the mortar upon the block a sheet of rubber cloth, ¼ inch thick, should be placed between, or, when this is not obtainable, two or three folds of mill blankets, well tarred, will answer the purpose.

The mudsills should be of square timber, free from sap, bedded in concrete on the bedrock and secured by anchor bolts to the foundation; the also should be bolted to the linesills.

The uprights of the battery frames are supported in various styles: with diagonal braces and hog chains at front or back, or with so-called knee frames. In the former style the brace is placed on the same side as the counter shaft, which rests low down on the battery sills. This style is well suited for small mills using stamps not to exceed 750 lbs., but for large mills using heavy stamps the knee frames are the more suitable, with the counter shaft on a level with the cam shaft. What is known as the reverse knee frame forms a strong, compact construction, but requires the counter shaft to rest on the battery sills behind the frame.

The battery posts are made 24 inches deep and from 12 to 20 inches wide, the center one of a ten-stamp mill being made the heaviest, as having to bear the greatest strain. They are let into the sills and secured to the line timbers by bolts. Besides the braces, the posts are given stability above the mortar by the guide timbers, which extend from end to end in one piece, and are let into the posts to which they are bolted. The lower one is placed about six inches above the upper edge of the mortar, and the center of the upper one is about 3 feet from the top of the post. The seat for the cam-shaft bearings is cut in the upper part of the posts.

After lowering the mortar on the block, with the planed bottom resting evenly on the sheet of rubber cloth or folds of tarred blanket, it is fastened perfectly rigid by eight bolts, four on each long side, passing through the flange, which is cast on the bottom of the mortar. This flange is 4 inches wide and about 2½ inches thick. The feed floor should be high so that these bolts can be conveniently reached, to permit their tightening when required. The journals for the cam shaft, which are placed in the recesses cut out of the battery posts for their reception, are lined up and "babbitted" prior to receiving the cam shaft with its cams. The stems are placed from ½ to 1 inch from the cam shaft, and just far enough from the cams to clear them when dropping. The cam shaft is made of wrought iron or soft steel, from 4½ to 5 inches in diameter, turned true, and should have key-seats for securing the cams. There should be two key-seats, and placed one-third of the shaft circumference apart. At one end of the cam shaft the cast-iron "hub" of the belt pulley (with flanges) is keyed on. This pulley is built of wood, and turned true on the shaft. Where there is more than one battery to the mill, it is best to have a cam shaft for each ten stamps, as this permits of repairs, such as changing cams, etc., without stopping more than ten stamps.

(To be Continued.)

Use for Confederate Money.

"Did you ever know what has become of the greater part of the Confederate paper money with which this country was flooded some years back?" asked a local business man who had just returned from a trip to the Atlanta exposition. "No? Well, neither did I until I struck Atlanta a few weeks ago. In that town I found an old man who makes a business of quietly gathering in all the Confederate bank notes he can find. You know the stuff was issued by the ton during the war, and there is any quantity of it still floating around. When the old man gets a big bundle of the paper he sends it to Edison, the inventor, who pays a good price for it; Edison uses it to make carbon for incandescent lamps. The paper upon which the Confederate notes were engraved was made of the pulp of sea grass. This branch of the paper making industry has since become a dead art. Sea grass paper, when chemically treated by Edison, has been found to make the best sort of carbon for incandescent lights, and so there is always a demand for Confederate bills."—Denver Mining Industry.

Reasonable Geology.

NUMBER IV.

By FREDERICK DANVERS POWER, F. G. S.*

The result of a single experiment is not sufficient data to form a conclusion on; we require to confirm it by repeated experiments, so as to exclude all errors. Pyrites is frequently mistaken for gold because of its yellow color, and many disappointments have been caused by those who have mistaken quartz for diamonds, on account of its transparency, and the fact that it will cut glass, tests for its other qualities being considered superfluous. Ignorance of the qualities of what one is about to test have resulted disastrously, as in the case of those who confound hardness and toughness, and to test a diamond—which is really very brittle—have crushed it with a hammer on a blacksmith's anvil.

Artificial experiments enable us to discover and learn the properties of entirely new substances. Mere observation would never have led us to suspect the presence of the metal aluminum in clay.

Experiments may be conducted with scrupulous care, and still be of little value in themselves. If by accurate analysis we determine the presence of minute quantities of certain metals in a rock that occur in larger quantities in veins running through that rock, some one would at once conclude that the ore was concentrated from the surrounding rock; but after all this is only a hypothesis, which has not been proved. Another man may assume, with equal reason, so far as information gained from the analysis is concerned, that the vein has supplied the rock with these particular minerals, or that the rock is simply a medium through which ore passes from its source to the vein. If on further observation we note that shoots of ore are more frequent, richer, or confined to that portion of the vein which passes through certain rocks, and that these rocks are found, on analysis, to contain more of the metal than its neighbors, then the original hypothesis is strengthened, but still not proved, for there may be something in the rock that tends to attract or precipitate these particular minerals. We may note other facts, however. Perhaps we are able to limit those metals whose origin we are seeking to certain minerals in the rock, of which they may be a necessary or accidental constituent, that near the shoots of ore the rock is decomposed, allowing a more ready passage of water than the tighter undecomposed rock, and that the original mineral in which our metals occurred when fresh is altered, and the metals wholly or partly missing; the veinstone is also found to partake of the nature of the rock through which it passes. These and many other facts collected, little or nothing in themselves, when combined together, especially when tending in the same direction, help to verify our hypothesis.

Different effects may be caused by varying quantities, such as temperature, strength of solvent or reagents, motion, pressure, time, etc. Salts held in solution when under great pressure are precipitated when relieved of that force. It is our knowledge of the strength of solutions that enables us to tell with more or less accuracy the conditions under which salt and gypsum beds were deposited. By the fractional evaporation of a solution containing sulphate of lime and sodic chloride, first, the most insoluble salt is thrown down as gypsum, and then the common salt. If a flood took place periodically which brought fresh quantities of water into the basin, we would expect it to be marked by alternate layers of gypsum and salt, and, under certain circumstances, mud.

When by careful experiment and observation we have exhausted all our resources, and have ascertained the effect of surrounding things on the object we are investigating, we may then generalize, or infer that what we know to be true of a few things is also true of the whole class to which the few belong.

Many experiments have been made in connection with mountain building to prove certain theories. First, cloth was the material used, several layers of which were laid one over the other; when pressure was applied to the ends a corrugated surface was formed, which in some respects imitated ranges of mountains. The substance employed did not sufficiently approximate that of rocks; cracks and fissures did not appear; the tops of the artificial mountains were always anticlinal; whereas in nature, when of sedimentary rocks, they are frequently synclinal, and when the cloth was relieved of the pressure it fell back to its original position. Ordinary sandstone and slate could not be employed, as on the small scale allowed for such experiments they were practically unbendable. Other experimenters, such as Daubree, Favre, and Cadell, used substances that conformed more to the requirements of the case, and obtained, not only elevations, but also representations of other phenomena connected with mountain building; they also brought various forces into action, which assisted in making clear many obscure points. Professor A. Favre used a sheet of india rubber covered with a layer of potter's clay in a plastic condition, which was confined at the ends by wooden supports which moved with the rubber when it contracted, thus giving the necessary lateral pressure. H. M. Cadell considered the rocks as rigid, not plastic bodies like cloth or clay, so employed layers of damp sand, foundry loam, and, in a few cases, clay, with the laminæ of dry stucco powder between, laid down on stout wax cloth. Our knowledge of mountain building is almost confined to experiments such as these.

We often hear miners say that one cannot see an inch further into the ground than the pick's point penetrates, and that, therefore, the wielder of the pick is the real discoverer of rich fields, and not the boss who goes about with his hands in his pockets and directs them where to work. No one wishes to deny that the physical eye is unable to pierce the rocks, but our mental one frequently can. By reason we are able to ascertain the nature of a thing without actual trial, for the same causes under similar conditions will have the same effect. Of course, we must make sure that what we take as a standard is like what we compare with it, otherwise we would go wrong at the start; but it is not always easy to know when circumstances are the same. A geologist, by keeping his eyes open, can often form a very fair opinion of the nature of a deposit from its outcrop, or from the opening developed by costeening. He takes every little thing into consideration, from the vegetation, soil, secondary minerals, to springs of water and nature of the outcrop, general physical and geological features of the district, and, if there are any neighboring mines, from their underground workings. As a parallel case, might be taken that of a physician. When he examines his patient he does not deem it necessary to cut him open to ascertain the nature of a fever; he tells from external appearances, taking the temperature, noting surrounding conditions, and other indications, what the man is suffering from. But as in some cases the trouble is not discovered until after a post mortem, so before determining certain obscure points in geology one must have recourse to mining operations. A doctor is often baffled by the deceit and untruthfulness of his patient, who conceals certain facts that should be made known to his medical adviser; but an inanimate object, having no will of its own, is subject solely to the laws of nature, which it is our business to master. An unobservant miner is, to all intents and purposes, simply a machine in the hands of his boss, and has no more right to be considered the unraveler of geological problems than a rock drill that actually penetrates the rock, or the explosive that shatters it. It is often pure chance that one man is set to work in a particular place rather than his neighbor, and although he performs necessary work in turning over the pages for the geologist to read, no credit, on account of perspicuity, is due to him. It is quite an erroneous idea to think it is necessary to carry out a test in a direct manner in order to secure a correct result; it is neither indispensable nor always feasible to do so. The height of an inaccessible tree is more readily obtained by angular measurements than directly with a tape.

In order to solve a problem, whether physical or chemical, we form an ideal in our mind, and try to carry out the conditions in our experiments that we believe to have prevailed. These conditions are frequently of a complicated nature, which necessitates a series of tedious experiments carried out methodically and systematically—first, in an elementary state, and subsequently in combination. There is a difference between possible and probable hypothesis. A man wishing to prove a theory will naturally select such experiments as will fit in with his views, and may even produce the results he seeks, on a small scale, and yet the environments in nature of that which he wishes to demonstrate may be entirely different from those he assumed in his experiments. If still biased in favor of a pet theory, he may quietly ignore or distort adverse facts, knowing full well how difficult it is to distinguish partial truths, and that dogmas more than half false often pass current for a time as universal truths. To be able to judge correctly of facts requires a well-balanced mind, so that one can pick out real from supposed examples, and avoid generalizing on exceptions, or confounding coincidences with necessary conditions.

(To be Continued.)

*London Mining Journal.

THE storage-battery patents of this country have passed under the control of a trust, the Electric Storage Battery Company; capital $10,000,000; headquarters in Philadelphia.

Seaboard says "that the great manufacturing city of New York uses only about five times the steam power developed by the engines of the steamship Lucania or the Campania."

Mining Summary.

CALIFORNIA.

Amador.

MAHONEY-WILDMAN.—*Ledger:* V. S. Garharini has the contract to put twenty stamps of the old Mahoney mill, in running order. Some time ago twenty stamps of the original mill were started up and when these are running the entire forty, the capacity of the old mill, will he in operation.

SOUTH EUREKA. — The twenty-stamp mill at the South Eureka has heen pounding away on quartz for a couple of weeks and the clean-up will he made in a short time, after a twenty day's run. Water is used for power at the mill and steam at the hoist.

THE ALMA.—At the Alma mine everything is being done to get matters in readiness to continue sinking. Wood, timher and other supplies are arriving daily and the work of pushing the shaft to a depth of 1000 feet is hegun.

THE ARGONAUT.—The compressor huildirg at the Argonaut is completed and the compressor is installed. The new hoisting machinery is all completed and will he put to work hefore the end of the year, for when the water in the mine requires much power to handle it the engine now in use will hardly he able to do the work. The shaft is now down ahout 975 feet.

Calaveras.

THE MARSHAL MINE.—Angels *Echo:* The Marshal mine in this town, known also as the Bovee mine, now under the management of Nate McKay, is one of the richest mines on the mother lode. In early days this mine was worked hy the Winter Bros., who took out over a half of a million of dollars in gold. They worked the ore in an arrastra, saving nothing hut the free gold, and not all of that. The sulphurets went to waste, and hy such waste thousands of dollars in gold went down the creek. The two-compartment shaft, which is 258 feet deep, has heen thoroughly retimhered from top to hottom. A test of the ore was made the other day, and it proved highly satisfactory. The hoisting works are completed, and the work of putting the engine and boiler in place is now going on; and as soon as the machinery is all in place, stoping will be commenced in the mine.

Nevada.

THE PENNSYLVANIA M. Co.—At the Pennsylvania mine ore is now heing extracted from the 700 level that averages $30 per ton. The French syndicate offer of $100,000 was declined.

CENTRAL DRIFT.—*Transcript:* The Central drift gravel mine, located near the Central House, has heen leased to Joseph Faull. The owners of this mine believe it to he on the same channel with the Harmony, near Nevada City.

FOUND THE LEDGE.—*Transcript:* The Pittshurg company has had men at work for the past two years hunting for the long-lost ledge in the south end of the mine, and this week they found it.

FOUND AN OLD TUNNEL.—The Red Dog Mining Company, of You Bet, in sluicing out Missouri canyon, cut the hed of slickens down and uncovered the mouth of the old Beyers tunnel, which was long ago closed hy the canyon being filled with slickens. The company now intend to reopen the old tunnel and extend it through their ground.

AT RAGON FLAT.—The Ragon mine, down at Ragon Flat, is getting richer every day. There is a strange mixture of gravel quartz in this claim, and hoth are rich.

Orange.

CEMENT MINE.—A new cement mine has heen unearthed in Orange county that gives promise of great wealth. The indications are that there are large quantities of it. The mine is located near El Toro; it is reported that Claus Spreckels is interested in the property.

Placer.

THE HASKILL OR GAYLORD.—*Argus:* It is the intention to commence operations at once, probahly at the point where the very rich gravel was struck.

THE MARGUERITE.—The final papers were drawn up this week hetween Jason Smith and Mr. G. Schmitt, representing the Marguerite, wherehy the former conveys to the Marguerite company the old Salsic claim. Superintendent Fred Deetken says the proposition is to crosscut on the 250-foot level of the Marguerite to the Salsic claim, going considerable over a hundred feet helow the Salsic shaft. The shaft of the Marguerite is now down 300 feet. They have two good prospecting ledges 2½ and 3 feet in thickness.

Shasta.

BOUGHT TWO MORE LOCOMOTIVES. — *Free Press:* The Iron Mountain Railway Company have purchased two more narrow guage locomotives, which are expected to arrive at Keswick this week. The grade on the line from Keswick to Iron Mountain is so heavy that it will require two engines to haul a train of any length up it.

THE SPANISH MINE.—H. Deakin is giving attention to the development of the Spanish mine near Shasta. He has a shaft down one hundred feet in ore that goes $9 to the ton. Eleven men are employed, and Mr. Deakin expects to get out a large quantity of ore for the smelter at Keswick.

AT KESWICK.—The first furnace now building at the Risdon Iron Works will he finished in six weeks. The present plant will accommodate an output of 600 tons daily, hut this will he increased until the yield will aggregate at least 1000 tons per day. Track layers are busy on all parts of the line, and the woods from Keswick to the mine are literally full of men. Fully 1300 men are employed on construction and development.

GENERAL NOTES.—*Democrat:* A rich body of ore was struck in the Niagara recently, in the O'Neal tunnel, and Superintendent Hanley states that the outlook is more encouraging than for years. They will start up soon with ahout forty men, and many increase the working force to 100.

Ten men were put to work on the Deakin & Taylor mines near Shasta, a few days ago. The old shaft used hy Jas. Sallee was pumped out this week, the old works are heing repaired, and preparations are heing made to develop this mine.

Paige, Carter and Fuller have heen at work on the Clear Creek Ditch tunnel, for over two months, preparing to hring water on the old Richardson gravel claim, which they have secured.

Livingston, Blaisdell, Cooney, Leivsay and Behrens who form the Big Four Mining Company, are sinking a shaft on the mine purchased from Emerson, Taylor and Johnson.

Chas. Jones has moved his mill from Muletown, to little Maud mine at Iron Mountain.

Siskiyou.

MINING NOTES.—*Journal:* Lamh & Franklin's quartz mill in Yreka will he started up again shortly, or as soon as sufficient quartz is hauled from the Williams & Wademan quartz ledge on north fork of Greenhorn. Work was suspended in the mine for a short time on account of the death of Williams from a cave in the tunnel, hut having heen well timhered since it is now heing worked with good success hy the surviving partner—Wademan—and a number of employes. This ledge pays from $30 to $50 per ton, with gradual improvement as the claim is developed.

The American Bar Co., at Ash creek, Klamath river, will soon be down to bedrock in the river, with expectation of finding richest pay, although the ground pays ahout $1.50 to the cubic yard from the surface down.

Espey, Hunter & Co. have stopped working their claim at Hawkinsville, and also shut down the pumping plant, in order to make a clean-up which will take several days, as much of the piping was conducted into ground sluices.

We hear that a San Francisco company has made au offer of $50,000 for the Espey, Hunter & Co. claim and pumping machinery at Hawkinsville.

The deal for the Schroeder mine on Deadwood, at $50,000, will probably he a go, notwithstanding the burning down of the mill and huildings lately, as the purchasers will want to put up a much larger mill.

Dietrick, the former Oak Bar mail carrier and now mining at Smith river, Del Norte county, says, in addition to finding cinnahar and silver ore in his claim, that he has also discovered a good quality of tin, and he thinks tin can he found in the Siskiyou mountains bordering on Del Norte county.

James W. Main of the American Bar mine, Klamath river, who was in Yreka last Sunday, showed us a peculiar nugget of gold which weighed $43. It was a flat piece in the form of bent metal, very different from the general style of nuggets found, heing ahout four inches long and one inch wide, and about as thick as window glass. It was of fine quality, as all gold taken from that claim sells at $18 an ounce.

A number of Seattle capitalists having purchased a lot of rich mining ground near Happy Camp, Klamath river, are now huilding a ditch of six and one-tenth miles in length from Thompson creek, to work the same hy hydraulic process. The ditch is to he four feet wide on the hottom and will carry a large body of water. This company will no doubt take out considerable gold dust when the claim is opened and developed, as all the ground in that section has paid rich.

A large body of quartz has heen found in the Black Bear claim at Salmon river, or is really a new ledge. It is ahout two feet or more wide and as far as opened extends a distance of over eighty feet. All the quartz taken out pays from $20 to $25 per ton, and there seems to he no douht ahout this ledge proving as extensive as the original Black Bear lode.

Tuolumne.

NEW LIFE IN TUOLUMNE.—There is a rush of travel to the rich mining regions of Tuolumne county, and the old line and opposition stages have cut the fare to $2 each way. The fare from Milton to Sonora, Columhia or Jamestown, is now $2, and the stages go out loaded to the limit every day.

The old town of Jamestown is now a thriving little city, and where there were only ahout twenty residents in the place two years ago, there are now hundreds, and buildings are being rushed to completion to house the newcomers for the winter. The old Bella Union hotel of early days has heen almost deserted for many years and has not heen used as a hotel for a quarter of a century until recently. Now it is open for travel and two other hotels are heing erected to accommodate the new husiness. In addition to the other structures in course of erection is a foundry and machine shop, which is owned hy Demarest & Fullen of Angels.

In the new town of Stent, near the Quartz Mountain mines, ahout two and a half miles from Jamestown, husiness is heing done with a rush, and money is plentiful.

The Angels' *Voice* says Geo. W. McNear, the capitalist and wheat huyer, is preparing to estahlish an electric lighting and power plant on the Stanislaus river, three miles below Bostwick's har within four miles of Rawhide. The idea is to furnish ahout 2000 horse power, the amount of water located heing 40,000 miner's inches, or ahout 800 cubic feet a second. H. L. Smith, of Oakland, formerly engineer in charge of the construction of the Market street railway, in San Francisco, will have charge of the engineering, and it is expected that surveys will immediately he made.

NEVADA.

ON THE COMSTOCK.—The bullion statement of the Chollar for October is: Worked at Nevada mill, seventy-five tons of ore; gross proceeds in hullion, $1969.94; cost of reducing, $450; net proceeds in bullion, $1519.94; assay value per ton, $33.29; gross average per ton, $26.26; net average per ton, $20.26, mill worked 78.9 per cent.

The bullion statement of the Potosi for Octoher is: Worked at Nevada mill, 1100 tons of ore; gross proceeds in hullion, $24,877.55; cost of reducing, $6600; net proceeds in hullion, $18,277.55; assay value per seventy-five tons, $33.29; assay value per ton, 1025 tons, $28.32; gross average per ton, $22.61; net average per ton, $16.61; mill worked 78.9 per cent.

Pending repairs to the main shaft of the Yellow Jacket all work in that mine and in the Kentucky Con. has heen suspended.

In the Savage, on the 950-foot level west crosscut No. 1, started from the north lateral drift, was advanced a total distance of 190 feet, when it reached the west wall of the ledge and was discontinued. At a point 35 feet hack from the face of this drift they have started a north drift to prospect the body of quartz discovered hy the west crosscut. In the west crosscut from the face of the north drift they have upraised from the fourth floor to the eighth floor and connected with the north drift therefrom; this connection affords good ventilation. The north drift from the eighth floor of north upraise is advanced 70 feet; face is in quartz giving fair assays. During the week they have hoisted 63 cars of ore from the 950 and 1050 foot levels; car samples average $26 per ton. Shipped to the Nevada mill 72½ tons of ore and milled 207½ tons; battery samples average $25.51 per ton. Shipped to Selby's Smelting & Lead Company 528 pounds of crude hullion, the result of 577½ tons of ore worked at the Nevada mill.

SADORUS MINES.—*Silver State:* Since April 1st hetween six and seven thousand dollars worth of gold dust has heen taken from the Sadorus placer mines.

WILL BUILD A MILL.—*Tribune:* Tired with the enormous expense attached to the shipping of their ores from De Lamar, Nev., to Salt Lake, the April Fool owners have decided to put up a mill for the treatment of their ores. Frank Wilson, the principal owner of the mine says the proposed capacity of the mill is ten stamps, with a cyanide plant equal to the crushing capacity.

SHIPPING ANTIMONY.—The *Central Nevadan* says ahout sixty-four tons of antimony came over the N. C. last Saturday, coming from Pradier Bro.'s mine at Big Creek, Lander county. It was shipped to San Francisco.

A HOPEFUL FEELING.—The White Pine *News* says a fine development of carhonate silver-lead ore has been made hy Henry Steady in the Ne Plus Ultra mine in Swansea canyon. There has heen quite a hopeful feeling generally prevailing in Hamilton, that the old town that witnessed during 1868-'69-'70, the liveliest times ever seen in Eastern Nevada, if not on the coast, will again forge to the front.

THE PINE NUT SALE. — The *Tribune* says Raycraft, Livingston, Russak and Deal, representatives of an Eastern syndicate, returned to Carson from an inspection of the Zirn-Schultz mine in Pine Nut, say that Pine Nut is assuming the dignity of an old-time mining camp. It is an assured fact that the sale of the mine, with its extensions, will shortly he made to the Eastern syndicate; the parties who last visited the mine confirmed the report suhmitted hy expert Eldridge.

A NEW CORPORATION.—The Virginia City *Enterprise* reports articles of incorporation filed in Carson of the La Grange Ore Consolidated Hydraulic Mining Company; capital $5,000,000: Directors, A. Livingston, W. F. Brann, A. Cohn, M. Cohn and H. K. Brown, all of Carson. The company has control of the King Bros. claims and the Ninety-four mine, in Gold Canyon. King Bros.' property is honded for $35,000.

LYON COUNTY.

The Lyon County *Times* says with a whole lot of good placer mining ground honded, and Silver City and Como giving indications of being extensive gold producers, that section of the country may reasonably expect a moderate hoom next spring.

OREGON.

THE BONANZA MINE.—The Bonanza mine on the 8th sent in a clean-up amounting to $4500, the result of a two weeks' run. The ledge, at a depth of 350 feet, is twenty-two feet wide. A 1400-foot tunnel is heing run to tap the vein at the depth of 800 feet, and the capacity will he increased from ten to twenty stamps.

IDAHO.

CŒUR D'ALENE MINES. — The Standard mine is now working eighty-five men. The Poorman and Tiger are working a small force. The Frisco has seventy-five men employed but the Gem is shut down for lack of water to run the mill. In Wardner the Bunker Hill and Sullivan, the Last Chance, the Stemwinder and the Sierra Nevada are taking out ore. The Hunter mine at Mullan has also resumed operations.

IN THE CŒUR D'ALENES.—The Bunker Hill and Sullivan mine was closed down for two days last week to make some repairs to the tramway.

Ahout a dozen men are now employed ou the Sierra Nevada mine, doing development work.

Ahout eighty men are employed on the Frisco mine. The concentrator is running the day shift only.

The lessees of the Stemwinder have the mill and tramway in operation. Only a small number of men are employed.

BRITISH COLUMBIA.

THE CARIBOO MINE.—The Cariboo mine on the South Fork of Quesnelle river, comprises a hank of gravel two miles long on the river side, a canal eighteen milcs long, discharging water through two nine-inch nozzels. Twenty-nine days in August of ahout fourteen hours each turned out $41,875.65.

BLUEBELL AND PILOT BAY SMELTER.—A. B. Hendryx, general manager Kootenay Mining and Smelting Co., owners of the Bluebell mine and the Pilot Bay smelter, says: "The compressor and drills at the mine will be ready for operation in about 20 days. It is the intention to keep one of the drills continuously at work on the vein of copper on the lower level. There is another vein of copper-hearing ore in the mine which carries one ounce of silver to each per cent of copper. At the smelter the work is going on much as usual. We are using ore from the Skyline and Number One mine at Ainsworth."

TERMS OF SALE.—The terms of the sale of the Winnipeg in the Wellington group, Boundary Creek district, hy D. McIntosh to J. R. Toole, representing Marcus Daly, are given hy the *Minina Advance* as follows: One thousand dollars down; $4000 as soon as the crown grant is ohtained, which will he as soon as the claim is surveyed and it can be issued, and $55,000 hefore the 15th of July next. Between the present and the 15th of July the purchasers are given permission to carry on development work at their own expense, the proceeds of the ore shipped, if any, to revert to the original owner.

UTAH.

NEILL'S FURNACE TESTS. — *Tribune:* The initial furnaces of the Neill process of fire concentration, the design of James W. Neill of this city, that have heen put up at Bingham to work on the sulphuretted ores of the Utah mine, are now working full hlast and successfully. Ahout forty tons of pyrites of iron are heing roasted daily in each furnace. Mr. Neill's application, provides for a system of blast and a specially designed grate through which the oxygen is forced to mix with the flame of the sulphur in the ores that are thrown on the top of the grate. The fact that one furnace with one man in charge can successfully desulphurize forty tons of ore per day, and without fuel, shows the advance that has been made in pyritic furnaces since the time when a roaster meant a stack of cord-wood, in the interstices of which the ore was placed.

NEW COMPANY.—The Searchlight Gold Mining and Milling Company has incorporated to operate near the Sunshine in Camp Floyd district; capital stock, $1,500,000; incorporators, J. Barnett, S. Spiro, J. Oherndorfer.

COLORADO.

BIMETALLIC SMELTER AT LEADVILLE.—*Herald-Democrat:* The Bimetallic smelter is one of the most interesting of the various plants which are now being operated in this city. It is interesting especially to the smelting man, on account of the unique methods employed in the treatment of ore, although to the layman there is practically no difference in the process. The product of the Bimetallic, however, is a matte, containing the gold and silver combined with iron or copper.

The miners in the Little Johnny have received a raise of wages from $2.50 to $3 per day. Manager Campion says the raise was made to keep good miners at work there.

LOWER CALIFORNIA.

STARTED UP.—The new fifty-stamp mill at Calmalli, has begun operations. Don Emiliano Iharra, late owner of the Calmalli is interested in the Jacolitos district, and has sent five wagonloads of supplies there from San Diego.

MEXICO.

AT MINAS PRIETAS.—The new roasters at Minas Prietas, are in operation. The two have each a daily capacity of fifty tons tailings from the Minas Prietas mill. The wire rope tramway, 700 feet long, carries the tailings from the dump to the drying floor of the roasters, and after undergoing treatment the tailings are again run through the mill, saving the gold which was not taken up in the first handling hy the mill, which was of such value that the new operation is profitahle.

Obituary.

A DEPLORABLE ACCIDENT occurred at the Maryland mine at Grass Valley, Cal., last Saturday morning, hy which Victor L. Dorsey, son of Supt. S. P. Dorsey, lost his life. He had gone to the hottom of the shaft between the 1600 and 1700-foot levels, where a part of the hanging wall fell upon and crushed him. Death ensued in two hours. Deceased was 28 years of age, a clever electrician and of unusual mechanical ability.

THERE died at Pasadena, Cal., this week a Pacific coast pioneer whose career illustrates how wealth can he made hy men who see and utilize opportunities. Reference is made to Simeon G. Reed, who in 1859, with William S. Ladd, R. R. Thompson and J. C. Ainsworth organized the Oregon Steam Navigation Company, which for twenty years controlled communication hetween western Oregon and eastern Oregon, eastern Washington and Idaho. The company practically owned the Columbia river, and all passengers, all freight paid toll to it. They huilt steamers to ply on the Columbia, Willamette and Snake rivers, and a portage railroad at the Cascades. All the gold taken out of Idaho was carried hy these steamers. The company was organized with $200,000 capital, divided $4,000,000 of profits, and in 1880 sold out to Henry Villard for $5,000,000. who organized the Oregon Railway and Navigation Co. and disposed of it for $14,000,000. In 1888 Mr. Reed and others hought the Bunker Hill and Sullivan mine at Wardner, Idaho.

A Practical Suggestion.

TO THE EDITOR:—It will be a great misfortune to the mining intcrests of Califor should the Land Office continue to iss patents to the mineral lands claimed hy the railroad as agricultural, and concerted action to prevent this is necessary.

The best protection to the miners and to the

Goverament is to havo all agricultural lands granted to the railroad appraised by a competent commission, to he created by an act of Congress, and their valuo to ho credited on the railroad's indohtedness.

This seems to ho the best and only true solution of this great question, and it will protect tho Government, protect the miner, und reduce the road's indehtedness to the extent of value of the land, and solve tho problem in an equitahle manaer.

I hopo this method of adjusting tho question may meet with your fall approval and that of the daily press, and of all who have the mining interest sincerely at heurt.

GEO. JOHNSTON.

San Francisco, Nov. 14th, 1895.

Personal.

G. V. GRAY has returned from Mexico.

FRED'K KEFFER is located in Tucson, Arizona.

GEO. R. PINNEY has gono to Boston to float the Rawhide stock.

F. A. HALL is now assayer for the Monte Cristo, Wash., Mining Co.

J. B. HAGGIN, who was last week reported seriously ill, is convalesceut.

J. B. MAGRUDER is superintending the new roasters at Minas Prietus, Mexico.

R. H. TERHUNE is now generul manager of tho Rico, Colorado, reduction works.

CHAS. M. DUNLOP goes to the Lucky Boy mine, Custer, Idaho, as chief ongineer.

E. C. WRIGHT, general auditor of the Southern Pacifie Co., has returned from Japan.

LIEUT. C. E. GILLETTE, of the U. S. Debris Commission has returned from Sierra Co.

GEO. MAINHART started the machinery at the Bullion mine, Grass Valley, this week.

HERBERT VISCHER of tbe Debris Commission is on a tour of inspection in Plumas county.

J. C. CAMPBELL will have charge of operations at the Old Flag mine, Bear's Valley.

W. R. RUST, manager of the Tacoma Smelting and Refining Co., reports continued success.

G. A. INGERSOLL is erecting a custom mill at Tyson's Wells, Yuma Co., Arizona, for Plomosa district.

SEC'Y SONNTAG of the State Miaers' Association has returaed from a business trip to Nevada Co.

JOHN EDDIE has heen re-elected superintendent of the Peansylvaaia Miniag Co., Grass Valley.

ALBERT VESTAL of Red Bluff succeeds Wm. Fowler as superinteadent of the Trinity Consolidated mine.

C. L. MILLER is supervisiag the huilding of the dam at the Manzanita mine hy the Milton Co., at Sweetland.

JNO. H. TALBOT of Denver, Colo., has heen appointed general manager of the Helen Miaiag Co., Graham, N. M.

J. B. ELDRENGE is back from Chicago, where he has heen successfully negotiatiag the sale of mining properties in Nevada.

A. A. ABBOTT is visitiug his home in Sacramento. He has been opening up the old Santa Rosalia mine, Arizpe, Sonora, Mexico.

ALFRED L. TUBBS has been elected a director of the Sonthern Pacific to fill the vacancy caused by the recent death of A. N. Towne.

MAJOR W. H. HEUER, of the Debris Commission, has returned from a visit to the Omega Co.'s dam, which he praises very highly.

R. HAMILTON has resigned the superintendency of the copper smelter at Tucson, Arizona, and goes to Australia. Jno. Francis is his successor.

J. E. DOOLITTLE is superintendent of the new operations at the Alta mine, which is heing developed hy a tunnel directly under the town of Alta.

J. T. GRIBBLE of Nevada City, superintendent of the Reward mine, has heen appointed to take charge of the Merrimac mine, near Glenbrook Park.

G. W. PRESCOTT has resigned as superintendent of machinery and car departments of the Southern California railway, of the Atchison, Topeka & Santa Fe system.

CHAS. E. BENT, formerly superintendent Bunker Hill and Sullivan, Idaho, mines, is now superintendent for the Mexican Mining and Development Co., Altar, Sonora, Mexico.

THE position of foreman of the Monte Cristo Mining Company, vacated hy E. Goodwin, appointed professor of geology of the State School of Mines at Moscow, Idaho, is now filled hy William Stevens.

DR. A. SCHIEDEL, whose recent monograph on the cyanide process has attracted so much attention, sailed for West Australia on the Mariposa last Thursday, whither he goes to investigate some Westralian mining properties.

BENJ. TIBBEY, superintendent of the Parrott mine, at Butte, Montana, recently refused an offer of $12,000 a year to take charge of some mining operations in Japan. He has heen with the Parrott fifteen years and is too proud of it to go anywhere else.

JOSEPH ARON, a former San Francisco resident, is now conducting a mining journal—*La Mine d'Or*—in Paris, France, and has lately heen pricking the Kaffir huhhle in the French capital. His crusade against the Barnato stocks has had considerahle recent effect.

R. H. CAMPBELL of Siskiyou has returned from a visit to the Horsefly Hydraulic G. M. Co.'s property at Quesnelle Forks, Carihoo, B. C., and is enthusiastic as to the possihilities of a hydraulic elevator there. He says he will put in two elevators there, a main and auxiliary. He will return there next April.

Books Received.

"Contribution No. 4 from the Lick Observatory: Report on the Total Eclipse of the Sun, Observed at Mina Bronces, Chile, on April 16, 1893," by J. M. Schaeberle, Astronomer. The 128 pp. of the book from the State Printing Office give a good account of that astronomical event hy the gentleman who first made the history thut he has written. The necessary fuads being supplied, Prof. Schaeberlo selected a point in the desert of Atacamu, Chile, from which to observe tho solar eclipse of April, '93, and with all requisite appliauces made the journey, wus successful in all his observations, and was ahle to muko several important additions to seience, all of which, together with a most interesting description of his journey, his computations, deductions therefrom, etc., are given, with severul illustrations. The technical description, especially of tho corona, is most interesting, its structuro, formation, and cause hoing given elaborate discussion.

Prof. Schaeberle says:

"With our present knowledgo of the condition of spaco extorior to the earth, all deductions reluting to the electrical conditions in this spaco must he considered to he of u purely speculative character. Wo have no direct evidence that the sun is an electrified body. We have direct evidence that tho sun is continually ejecting enormous quantities of material particles of matter with very great velocity."

Further on, he says:

"My own investigations seem to show that, so far as the eclipse of April, 1893, is concerned, there is no evidence to indicate that either electricity or magnetism has anything to do with the arrangement of coronal matter in the sun's neighhorhood."

With tbe modesty characteristic of true scientists, Prof. Schaeberle refers hut briefly to his own part in the journey or its success, ascribing the credit to his assistants, hut it is manifest that the scientific world owes the information resultant from the Mina Bronces expedition largely to the intelligeace and zeal of the gentleman who brought the entire matter to a successful conclusioa.

"Journal of the Franklin Institute for November." Valuable monographs are "Tests of Cement Mortar Mixed with Various Kinds of Sand," "What Is Bitumea?" and "On tho Technical Analysis of Asphalts," the latter hy S. P. Sadtler, Ph. D.

"Economic Mining: A Practical Handbook for the Miner, the Metallurgist and the Merchant," C. G. Warnford Lock, pp. 668. The author declares his desire to produce a hook that would he of more practical importance than scientific value. His idea, more fairly stated, appears to be to give facts of importance to the mining world as a husiness proposition, apart from any abstract discussion of underlying facts. In this he has heen successful, in compiling a work that is of considerahle practical value. Its scope is comprehensive, including prospecting, power, drilling, blasting, shaft siukiag, ventilation, lighting, draining, hauling, hoisting, reducing, concentrating, etc. The cheapest aad hest way to put metalliferous and non-metalliferous minerals in commercial form is given extensive discussion, and many recent publications of facts relative thereto have been laid under contribution. The work is written from an English standpoint, applies largely to English mines and methods, and has a foreign flavor that tends to detract from its local value. It is published hy E. & F. N. Spon, 125 Strand, London, and Spon & Chamberlain, 12 Cortlandt St., New York, and is fully up to the typographical excellence of that house's publications. The price of the hook is $5.

"Modern Copper Smelting," by Edward Dyer Peters Jr., Seventh Edition. The first edition of this work, which appeared in 1887, commanded wide sale, and the present prominence of the copper industry justifies the author in practically rewriting the hook. This volume of 642 pages contains nearly all that is at present known ahout copper and the hest way of working copper ore, and on the principle that everyhody is wiser than anybody, the author has not hesitated to utilize valuahle information on that subject wherever procurahle. A two-page article which appeared in this paper on Jan. 12th, 1895, entitled "Improvements in Matte Smelting," hy Herhert Lang, extracts from other mining journals, Nicholl and James' paper on "Direct Refining," R. Sticht on "Pyritic Smelting," W. L. Austin, and other authorities have heen cited on the suhject, the compiler giving partial credit for what he thus used. Besides all this, Prof. Peters has made valuahle contribution to applied science in his very full discussion and description of modern methods, and gives many poiats of procedure ordinarily considered "trade secrets." The commercial importance of the red metal and the recent radical changes in copper smelting justify the timely appearance of this volume, which is of great metallurgical importance in the field of which it treats. It is issued hy the Scientific Publishing Co., 253 Broadway, N. Y.; price $5.

"Lead and Zinc Mining in Missouri and Kansas," with Map; a 55-page pamphlet hy John R. Holihaugh, of interest to the section discussed. Scientific Publishing Co., N. Y.; price 50 cts.

"The Production of Iron Ore in Various Parts of the World," by Jno. Birkinbine, pp. 204; an elahorate monograph on a subject of world-wide interest from competent authority; puhlished by the U. S. Geological Survey, Washington, D. C. The statistics are complete and up to date, the descriptions of mining and smelting processes are from the hest sources, and the accompanying tables and illustrations are of the superior nature characterlstic of United States Government publications.

Coast Industrial Notes.

—On June 30, 1894, there was in California 4861 miles of railway.

—Modesto men figure that in that section of the State it costs 80 cents per centul to raise wheat.

—Fiual survoys are being mado on tho Yosemite Valley railroad, from Merced to the Yosemite Valley.

—The South Yuba Water Company has a franchise to erect olectric light poles, etc., in Sacramento couaty.

—The South Yuba Water Co. will complete their liuo of poles and wires from Newcastle to Sacramento by Dec. 1st.

—The Seattle, Wash., Power Company announces intontion to spend $3,000,000 in u water and power plant thore from Cedar river by wny of Swun lake.

—Nearly 500 employos of the California Sugar Refiuery at the Potrero will he idle till Feh. 1st, '96, whon the repairs to the iustitution will ho completed.

—The transportation committee on securing the Republican National Convention for San Francisco, havo tho assurance of a $50 round-trip railroad rate between hero and Chicago.

—The Hudson Reservoir Co. on Salt river, sixty miles from Phoenix, Ariz., has been reorganized in New York. H. C. Manu is the new president. Work begius this month on the dam.

—Railway time from New York to San Francisco has been reduced to four days on the regular daily service on the lines coming into this city. From Chicago the time is three days.

—The forthcoming report of the Engineer Commission, which visited Nicarugua last summer, will recommend the huilding of the Nicaragua Canal hy the United States. The cost in estimated at $100,000,000.

—The Pacific Coast Oil Co.'s new tank oil steamer, the Geo. Loomis, was launched at the Union Irou Works last Saturday. It will carry 6000 barrels of oil each trip from Ventura and will use the petroleum for fuel.

—John Rosenfeld is credited with beiug at the head of a San Francisco syndicate to huy and develop 5000 acres of coal land iu tbe vicinity of the coal mines of the Alameda and San Joaquin R. R. Co. A railroad thence to Oaklaud is a part of the outlined scheme.

—A $150,000 cokiug plant is to he erected at Anthracite, on the Canadian Pacific Railroad, east of Banff, for the purpose of using the Canmore coal. This is an anthracite product, and is said to he the only true anthracite coal ia the Northwest. The mines were discovered fifteen years ago.

—The State fruit growers report an output from 1890 to 1895 as follows: Fresh deciduous fruits (shipped), 621,491,500 pounds; fresh citrus fruits (shipped), 521,047,400 pounds; cured fruits (produced), 400,600,000 pounds; raisins (produced), 335,000,000 pounds; canned fruits (produced), 427,159,500 pounds. Total pounds, 2,308,298,400.

—From January 1st to Octoher 1st, '95, specie exports from San Fraacisco aggregated $20,588,800; during the same time last year there was exported $24,010,000. Of this year's exports $14,540,061 went to China and Japan aad $5,405,565 to New York. Among the items were, Mexican dollars, 7,777,000; silver hullion, $6,923,000; gold coin, $4,306,000.

—The Pacific cahle scheme, advocated by several of the Rritish colonies and the Dominion of Canada, was discussed at a meeting of representatives of Canada, Australia, New Zealand and the South African colonies, at London, Octoher 29. The new instructious sent hy the colonies to their ageuts general show that the colonies are for the most part willing to bear their share of the expense, and are anxious that the matter should he pushed actively.

—The operators of the Siherian Railroad, now in course of construction from the Black sea across to Vladivostock, havo placed a large order for locomotives. The Siherian Railroad when completed will he one of the longest in existence; its tracks will extend across 7,500 miles of territory. The completion of that road will render possihle, at a comparatively small expense, the shipment of materials and products from the Pacific to the Black sea districts.

THE CALIFORNIA DEBRIS COMMISSION, having received applications to mine by the hydraulic process from Niedecker & Alderson, in the Bobby Burns Mine, near Placerville, El Dorado Co., to impound tailings in a ravine below the mine; from Martin Bros., in the Martin Mine, near Placerville, El Dorado Co., to impound tailings in a ravine below the mine; from Eugene Piaggi, in the Blacklock Mine, near Placerville, El Dorado Co., to impound tailings in a dry ravine; from H. E. Picket, in the Tiedman Mine, near Georgetown, El Dorado Co., to impound tailings in Marshall Canyon; from Geo. W. Davey, in the Sailor Creek Mine, near Garden Valley, El Dorado Co., to impound tailings in Irish Creek; from Mrs. Bertha Sutton, in the Jackson Creek Mine, near Cronuberg, Plumas Co., to impound tailings in old pits; from Simcoe Chapman, in the Dutch Mine, La Porte, Plumas Co., to impound tailings in Rabbit Creek; from Fred Lewis, in the Lewis Mine, on Rich Gulch, Plumas Co., to impound tailings in Rich Gulch; from Fred Scott, in the Arctic Mine, near Butte Valley, Plumas Co., to impound tailings in Marian Creek; from Chas. Y. Hepler, in the Miocene Mine, near Crescent Mills, Plumas Co., to impound tailings in Sneider Gulch; from Ed. Bryan et. al., in the Chaparral Hill Mine, near Saw Mill Flat, Plumas Co., to impound tailings in a dry ravine; from the Plumas Blue Gravel Mining Co., in its mine near Nelson Point, Plumas Co., to impound tailings in an old pit and on flat-ground; from J. B. Higgins, in the Michigan Hill Mine, near Quincy, Plumas Co., to impound tailings in old pits and on flat ground; from Daniel Conlan, in the Pacific Mine, near St. Louis, Sierra Co., to impound tailings in an old pit; from J. M. McClung, in the Ram Creek Mine, near Brush Creek, Butte Co., to impound tailings in Ram Creek; from George Reese, in the Reese mine, near Redding, Shasta Co., to impound tailings below the mine; and from the Eureka Lake & Yuba Canal Co., in the Farrel Mine, Columbia Hill, Nevada Co., to impound tailings in worked-out pit—gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Nov. 18, 1895, at 1:30 P. M.

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CALIFORNIA STUMP PULLER.



This is a photograph of the Stump Puller at work on redwood stumps on the farm of C. E. Ogburn, Guerneville, California.

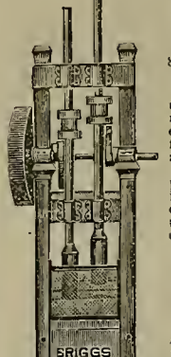
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Electrical Progress.

The Portland, Oregon, Power Transmission Plant.

(*Continued from page 317.*)

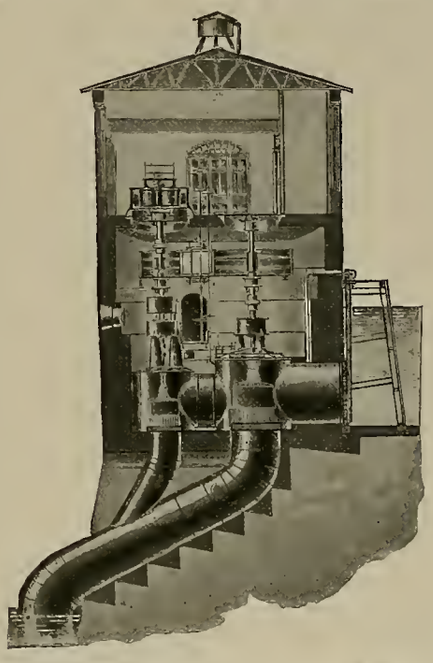
From the generators the current passes directly to the line through the switchboard. The line is 14.3 miles long, a separate circuit being installed for each machine. It passes through an undulating country following the course of the Willamette river as closely as possible. The poles upon which the three-phase wires are strung also carry a number of wires for the 5000-volt continuous arc current from the old transmission station, as well as the wires over which the old system of lighting with high frequency 5000-volt alternating current is effected. The loss in the long-distance transmission line is calculated at full load at about 17½ per cent.

The sub-station to which the high frequency lines are brought is a two-story building at the corner of Seventh and Alder streets, covering a space of 40x100 feet. The lower floor is divided into three rooms, one containing the transformers, the second the rotary converters, the other being used for a repair shop, lamp and meter room. The upper story of the building is occupied by the offices.

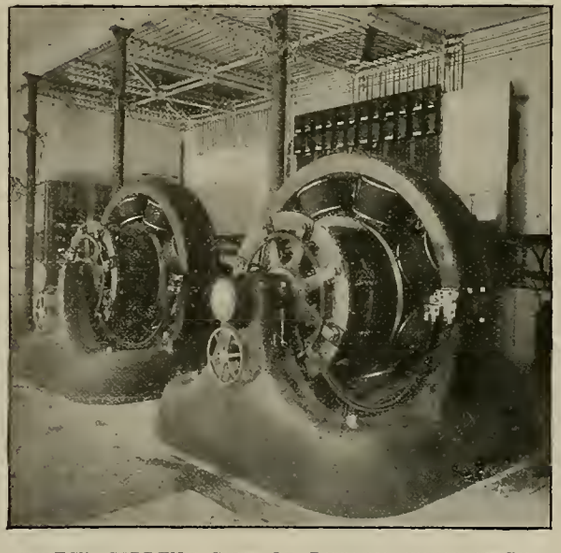
In the transformation room at present are the necessary transformers for the three units already installed—forty-five transformers in all. The receiving end of each line is connected to a bank of fifteen transformers per generator, five being placed between each pair of wires of the three-phase system. The transformers are mounted on an iron rack five transformers high and three wide, and foundations are already laid for six additional units. Each set of five transformers is connected to the primaries in series and to the secondaries in parallel, although in the transformation of the three-phase current only two sets are necessary. For the large units, with high voltages, however, as employed in the present installation, it is desirable to have a large number of transformers banked. The bank, therefore, is divided into three sets instead of two, so that each group may act as a reserve to the other two sides, enabling two-thirds of the power of each generator to be delivered even if the transformers on one leg of the circuit have to be disconnected; nor is the balance of the system effected by this change of connection. The transformers regulate at a little over one per cent variation of the secondaries from no load to a full load. The transformers are of the standard General Electric sub-station type, having numerous air passages between successive bunches of iron lamina and between the coils, so that they may be cooled by artificial ventilation. This enables the transformers to be worked at a high output of efficiency and yet remain cool. The distribution of light from the secondaries is effected on the Edison four-wire system, which allows of a large territory being operated from one transformer station, and which also allows of the working of synchronous and induction motors from the lighting mains. The four-wire system is worked at 133 volts between any two wires and by means of feeder regulators a variation of 7½ per cent in either direction is covered.

The direct current for the railway service is obtained by conversion from the three-phase alternating current. This is effected by means of rotary transformers, a type of machine which the General Electric Company has brought to a high state of perfection. Two of these are at present installed in the sub-station, and space has been left for an additional three. The capacity of each converter is 536 horse-power, delivered to the bus bars of the continuous current switchboard.

The long distance transmission lines for this railway service, as in the case of the lighting circuits, are connected to step-down transformers, transforming the current from 6000 volts on the line to 400 volts at the secondaries. The secondaries are connected to the three collector rings on one side, and the current is thus brought into the armature of the rotary converter. The alternating current at 400 volts is then converted in this machine into direct current at 500 volts at no load and 550 volts at full load, delivered from the commutator side. The rotary converters are arranged for self-regulation, the voltage on the direct current side compounding with the same regularity as that found in the best direct current dynamos, despite the varying losses on the long distance line and the varying armature reaction in the rotary converter. This regulation is entirely independent of the generator, which receives constant excitation at all loads. The shaft of the rotary converter is extended twelve inches beyond the bearing of the alternating current side to take a small pulley from which any small machine or an arc dynamo may be driven.



SECTION THROUGH STATION TRANSMISSION.



DIRECT CURRENT SIDE OF ROTARY CONVERTERS.

It is a noteworthy fact that, in spite of the long transmission line and the increasing load of the generator, the potential supplied to the railway lines steadily rises as the load is increased.

Each rotary converter has a capacity of 400 K.W. It is an eight-pole machine, making 500 revolutions. The armature is ironclad, carrying at one side a commutator and at the other three collector rings.

From the rotary converters the wires are taken to the power switchboards. Each converter has two panels—one for the three-phase current and one for the continuous current. The alternating current panel carries two double-pole switches—one for connection to the converters and transformers and the other to connect the converter to a set of common bus bars. An additional main switch is provided to connect the rotary transformer and the panel itself which carries also a set of fuses, three current indicators and a potential indicator with a transformer reducing the potential from 3½ to 1. The continuous current panel is of the standard direct current railway type with automatic circuit breaker and a current indicator added for the fields of the rotary transformer. The panels may be coupled in parallel on both the alternating and continuous current side.

The lighting switchboards in the sub-station consist of one panel for each leg of the three-phase system. The secondaries from the transformers are entirely independent and the panels carry fuses and two four-pole switches for coupling the feeders directly either to the corresponding transformer unit or to the bus bars and the switches for the operation of the feeder regulators. A current indicator is placed on each side of the four wires and three potential indicators between the four wires. On top of the switchboards are placed the main switches for opening the different feeders, and each panel is provided with ground detectors and lightning arresters.

At present the lighting from the three-phase system is used for large buildings, containing several hundred lights each. They are close to the city station and this distribution can be readily handled at about 400 volts. For the outlying and residential districts the high frequency apparatus with individual transformers will still be employed. Continuous current will be furnished to the railway and to the stationary motors already installed, but new motor installations will be made with the three-phase motors, which will be run straight from the three-phase switchboard in parallel with the rotary transformer.

The direct railway current will be carried to the East Side railway station by means of cables under the Willamette river, and this distribution will reach as far as Milwaukee, where connection will be made in parallel with the 600-volt service from either Station A or Station B at Oregon City. The loop from Oregon City to Portland and back will thus be as follows: Beginning at Oregon City with thirty-three cycle three-phase current at 6000 volts, 14.3 miles will be traversed as far as Portland; the current will then be transformed to 400 volts alternating and passing through a rotary converter, issue therefrom at 600 volts continuous, which will be transmitted eight miles to Milwaukee and connect with the continuous current from Oregon City.

This plant, when finished, will be one of the largest long-distance transmission plants in the world. Its satisfactory operation so far shows admirably not only the effectiveness of the three-phase transmission system for general service, but also its feasibility. This has rendered possible its adaptation to the operation of important railway systems through simple apparatus and to the working of a distributing network composed in a large part of existing lines.

Scientific Progress.

Apyrite.

Under the name of apyrite Herren Schiffer and Kircher of Grunstadt, in Rhenish Bavaria, work a mineral containing about 93 per cent of silica, and consequently very refractory. When mixed with water it forms a plastic and adhesive mass which, after dessiccation, becomes firm and resisting, while its volume does not change when exposed to the fire. Moreover, it is scarcely attacked by metals and scoria in fusion, which either do not stick to the surfaces made with it or are easily removed without the least detriment to the furnace. In the neighborhood of the mines apyrite, tempered with water, is used instead of lime mortar, and also for plastering. Slightly damped, this substance is punned so as to supersede firebrick lining, as in the case of various furnaces; and a large foundry cupola can thus be lined in a day by two men, while such a lining lasts longer than one of the same substance made up into bricks. For repairs to the firework liuing of furnaces apyrite is also very useful, while its low price, and the fact that it is a good non-conductor of heat, recommend it in the case of blast furnaces, puddling and heating furnaces, foundry cupolas and crucible furnaces.

Electrical Vibration on the Ear.

Whatever may be the outcome of the investigations now being made by New York and other aurists, on the effect of mechanical and electrical vibration in curing deafness and various diseases of the ear, it is certain that ordinary telephone conversation is heard much better by some people than by others, even where there is no manifest superiorty of the organs of hearing. An electrical journal illustrates the peculiarity amusingly by relating the experience of the salesman of an electrical supply house in an Iudiana town. The salesman was showing a pair of improved telephones, which had been installed for exhibition purposes, and a number of citizens present were pleased and surprised at the loud talking of

the instruments. One of the citizens had been almost deaf for many years, and more as a joke than with any idea of a test the others shouted into his car the suggestion that he should try the telephone. As the man put the receiver to his ear his face assumed an expression of mingled astonishment and delight. He could carry on a conversation with the person at the other end of the line without any apparent difficulty. Overflowing with gratitude, he promptly treated the crowd, and he entertained the salesman royally for the rest of his stay in town.

Relations of the Eye and Brain in Sight.

It is sometimes cited as a remarkable circumstance that we see things right side up, although the image thrown on the retina is upside down. Professor Brooks seems to share this popular opinion, for he writes recently in *Science:* "We all believe many things which are inconceivable, such as the truth that the image in our eyes is upside down." In the next number of the same journal (October 11th) a correspondent signing himself "J. McK. C." (probably Prof. J. McKeen Cattell) comments on this statement as follows: "But why is this inconceivable? To those having knowledge of elementary physics it is inconceivable that the image should not be inverted. Perhaps Prof. Brooks means that it is incomprehensible that we should see things right side up when the image is upside down. This is sometimes urged, but would seem to be sufficiently answered by a remark once made by Lotze in the presence of the writer: 'If any one is troubled by the fact that the image is inverted, let him suppose that the soul stands on its head.' It is, indeed, quite as reasonable to suppose that the mind stands on its head as to suppose that it stands on its feet and looks at the image on the retina, which would seem to be the assumption to those who are troubled by the phenomenon. A similar paradox is the fact that with two images on the retinas we see things singly. This may also be treated without undue seriousness by the question: 'If we hear a baby crying with two ears, why do we not think it is twins?'"

THE latest telephone idea is to utilize it in connection with train service. By means of a "hanging set," consisting of spliced rods with a cross arm at the top which can be dropped upon the pole line alongside the track, telephone connection can be established with every point on the line; and, in case of a wreck or blockade, information can at once be conveyed, orders can be sent by the dispatcher or superintendent, and the safety and facility of train movement can thus be increased.

THE scientific result of the experiments in electric canal towing at Tanawanda, New York, is that it was shown that by means of the Lamb system, which is nothing but a trolley car suspended from a wire, and to which may be attached the tow-line of canal boats, it is possible to move by electric power a tow of canal boats at a rate varying according to the current from four to five miles an hour, and at a cost considerably cheaper than that which mule or horse power now entails.

ON the 7th inst., Lord Rayleigh and Professor William Ramsey visited the the United States Embassy at London, where James Roosevelt, the secretary of the United States Embassy, presented them with a check for $10,000 which the Smithsonian Institute has awarded them as the first Hodgkin prize for their paper on argon, the new element discovered by them.

PROFESSOR LINDE is reported to be successful in putting to practical application the researches of Professor Dewar in regard to liquid air, which he proposes to utilize for the construction of a refrigerating system far in advance for economy and efficiency of anything in existence.

Mechanical Progress.

Magnetic Iron Ore.

By degrees metallurgists are finding ways of utilizing ores of iron which were once considered worthless. For a long time those containing a certain amount of phosphorus were without commercial value, for it was not then feasible to eliminate that impurity. The basic process now does so readily. A class of iron ores abundant in the South and on this coast are composed of magnetic iron mixed with silica, a substance which is melted with great difficulty. It is this characteristic of silica which makes it so valuable a compound of firebrick. But by crushing a magnetic iron ore tolerably fine, and feeding it into a magnetic separator, the part which it is desirable to obtain can be freed from its more refractory associate. It is then smelted in a furnace like any other ore and cast into pigs.

Now that the iron industries of the country are once more booming, the trade papers recall some interesting experiments made in 1892 and 1893 at Cranberry, in western North Carolina, where magnetic iron is obtained. These tests indicate that if the ore be crushed very fine part of the iron is lost by washing. Frank Firmstone, who conducted the investigation, recommends, therefore, that attention be paid to careful washing, screening and sorting into sizes, rather than to extreme pulverization, and that the several sizes (from 3-16 to 1¾-inch kernels) be collected separately by suitable magnetic apparatus. By good management he believes that such ores can be mined and worked profitably.

Telephones on Railway Trains.

A telephone attachment for railroad use has been introduced which will greatly increase the safety of railway travel. At present, the device is designed only for communication between the conductors and the nearest station, but the intention is to so modify it that it can be used by passengers traveling on express trains. By this arrangement the telephone can be called into requisition by the train dispatcher in addition to the telegraph dispatch wires, while on the other hand, the dispatcher can be called by any station or block along the line in a second. An ingenious part of the equipment is what is called a hanging set, which is to be carried in every baggage car and caboose. Should the train come to a standstill through a block, a wreck, or or any other interruption the hanging set, consisting of spliced rods with a cross arm at the top, is dropped on two wires on the pole line alongside the track. This gives a perfect connection as if the telephone were in a private office, and it will work along every foot of a railway line. In case of a wreck the telephone is instantly available, the dispatcher is called and orders are sent direct to the spot in return.

Tells the Story of the Track.

On the Boston & Albany railroad is a car like an ordinary parlor car, but bearing the name of no railroad, and having along the top of the car the words "Dynagraph and Track Indicator," the famous track indicator of P. H. Sedley, a machine which does the work of hundreds of men, and by means of which a number of important improvements in rail-building and matters of that nature have been introduced. After this machine has been run over a line of road there is an exact record on paper of the condition of every rail, and every foot of track on that road, and the machine is so perfect that it will record imperfections that are not apparent to the eye.

The operating department of the car takes up about half of it; there is a table for figuring, cabinets in which the records of the different roads are kept, and the dynagraph itself, which occupies a space of about four feet square. The keystone of the whole thing is the six-wheeled truck on which the end of the car rests. The wheels on this truck are constantly kept in perfect condition. The middle wheel on each side moves up and down in guides, over any of the imperfections of the track, and by this the dynagraph is operated. The top of the dynagraph is a flat table, over which a long roll of paper is run, being wound up again on the other side. The indicators which map out the condition of the track, rest on this paper and are connected with the moving wheel of the truck by mechanism which shows the slightest motion of the car or rails. The indicator arms are six inches long, projecting out over the paper. At the outer end of these arms are hollow glass points, like the points of a stylographic pen, filled with different colored inks and resting upon the paper, so that as the arms move in response to the movements of the car or trucks, the points trace out exact reproductions of these movements on the paper. There is an indicator for each of the rails, another to show unusual deflections of the rails, which indicates that the roadbed under them needs filling, and others to show the side motion or rolling of the car, the pressure on the two rails, and height of the different rails on curves.

Connected with the indicator that shows the state of the roadbed under the rails is an arrangement which sprinkles blue paint on the track so that the trackmen can tell at once where repairs are needed. Another indicator takes care of the distances, making a little dot every ten seconds, which shows by its relation to the other lines made by the other indicators, the exact location of every imperfection in the track, and it does this so exactly that the division superintendent can tell within a couple of feet where every imperfection is. The record made on paper is on the scale of one-eighth of an inch, and of course a chart of a hundred miles of road is of an immense size. It is from this that the repairs are made, but a condensed chart is also figured out from this, which shows the general condition of the whole section.

These maps are very interesting. The perfect road is indicated by a heavy line drawn through the middle of the chart. Where the rails are new and heavy, the line of the indicator will follow this closely, diverging from it only in slight and gentle waves, but the instant the car comes upon a section where the rails are old, that fact is recorded by great jagged angles on both sides of the line. The dynagraph never draws a perfectly straight line, because of course no rail ever can be made absolutely without imperfections, and also because there is a deflection under a heavy train of from two to three feet in a mile for a ninety-five pound rail. This is as close to being perfect as any road ever comes. This machine has been in use on different roads of the country for about fifteen years, during which time it has shown many facts which have been of the greatest service to manufacturers of rails.

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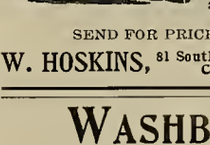
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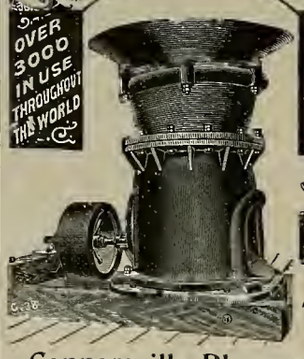

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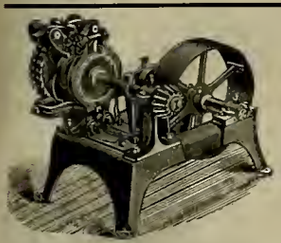
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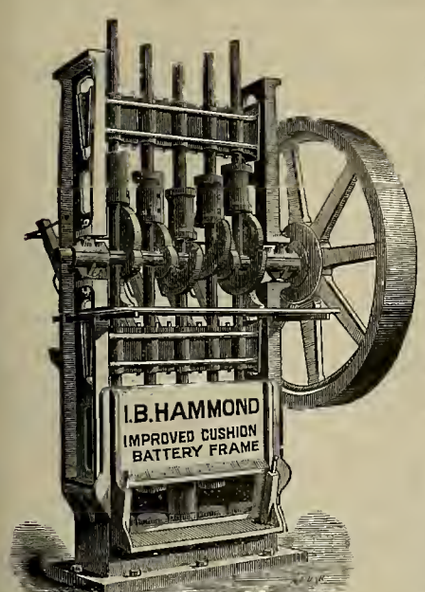
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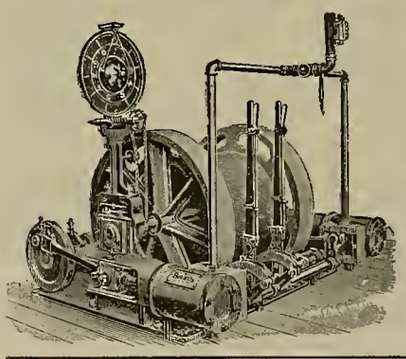
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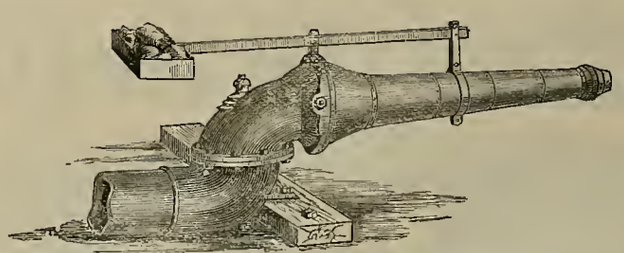
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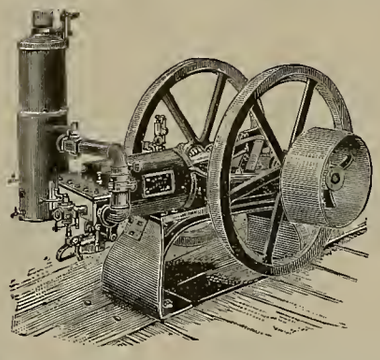
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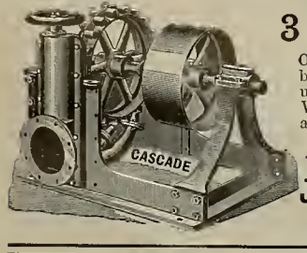
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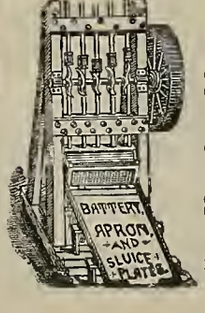
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Silver Plated Copper Amalgam Plates

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GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

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E. G. DENNISTON, - - - - - - - - - - Proprietor.

Every description of work plated. Send for Circular.

RISDON IRON WORKS,

SAN FRANCISCO, CAL.

READ WHAT MINERS THINK OF THE BRYAN IMPROVED ROLLER QUARTZ MILL AND JOHNSTON CONCENTRATOR.

OFFICE OF THE CANDELARIA CONSOLIDATED MEXICAN MINING CO.,
SAN DIMAS, DURANGO, MEXICO, October 25, 1888.

RISDON IRON WORKS, San Francisco—Gentlemen: Our company has been operating three of the 4-foot Bryan Roller Quartz Mills, one of which has been running steadily for three years, one for two and one for one year. Our quartz is very hard; we crush through a No. 60 mesh screen. Our mills run 55 revolutions per minute, and each crush through 60-mesh screens 12 tons in 24 hours; through 50-mesh, 15 tons; and through 40 mesh, 18 tons. This proportion has been continuous.

One set of tires will crush from 1200 to 1600 tons.

One set of tires will crush 1500 tons.

One ring plate will crush from 2200 to 2300 tons.

The mills require very little attention. At our mill an ordinary "peon," earning one dollar per day, has complete charge.

In regard to stirring, in comparison with stamps, by reason of the discharge surface and the continuous agitation by the scrapers, a much less amount of slime is created. A three years' experience teaches me that, in every respect, the mills are a complete success, and of material benefit to the mining world. They can be set up and running in forty-eight hours and can be dismounted in the same time and removed to wherever desired. Ours were packed on our mule trail over as difficult a road as any in Mexico. As a gold amalgamator it is unequaled by any mill now in existence. Yours truly,

D. M. BURNS, Superintendent.

BULLION-BECK AND CHAMPION MINING COMPANY,
EUREKA, UTAH, August 24, 1895.

THE RISDON IRON AND LOCOMOTIVE WORKS, San Francisco—Gentlemen: Referring to contract made by you with the Bullion-Beck and Champion Mining Company, by which you were to furnish one 4-foot Bryan Roller Quartz Mill on four months' trial, in competition with the Huntington Mill, would say that we have made the test, and the Bryan Mill has proven so greatly superior on all points claimed, viz., capacity and economy, that we have ordered a second Bryan Mill from you and have concluded to discontinue the use of the Huntington Mill.

Yours truly, JOHN BECK, Pres.

SIMON BAMBERGER, Director. [Copy.] W. J. BEATIE, Sec'y.

BULLION-BECK AND CHAMPION MINING COMPANY,
EUREKA, UTAH, Aug. 24, 1895.

THE RISDON IRON AND LOCOMOTIVE WORKS, San Francisco—Gentlemen: In February last, in connection with the five-foot Bryan Roller Mill which we took from you to test in competition with the Huntington Mill, we also took a six-foot Johnston Concentrator to be tested with ten Frues, one end shake with four belts and one side shake Woodbury. We have been working these machines since the mill was completed, at such times when we had sufficient water.

The terms on which the test was made was that the machine doing the most satisfactory work should be accepted and the others taken out. This did not apply to the Frue, as they were purchased with the plant. In compliance with this agreement, we now inform you that the Johnston Concentrator has proved so superior over the other machines that we now order from you four more of the Johnston Concentrators. Yours truly, JOHN BECK, Pres.

SIMON BAMBERGER, Director. W. J. BEATIE, Sec'y.

GREAT SALT LAKE AND HOT SPRINGS RAILWAY,
S. BAMBERGER, President and Manager,
SALT LAKE CITY, UTAH, October 10, 1895.

B. R. TAWNDRAW, Esq., care Guyer Hot Springs, Ketchum, Idaho—Dear Sir: In reply to yours of the twenty-eighth of September, we have been using at the Bullion-Beck Concentrating Works, Frue Vanner, Woodbury and Johnston machines, side by side for the last four months; and after a thorough trial of all of them, we concluded that the Johnston Vanner was doing the most accurate work and was the best; hence, we bought four more Johnston machines and shall continue to use them in preference to any other.

You will find it the easiest regulated machine and very much easier set up than either of the other machines. We bought our machines from the Risdon Iron Works, of San Francisco, where Mr. Johnston, the patentee, personally superintends the manufacturing of them.

Hoping you will make a success, I remain, Yours truly,

[Copy.] [Signed] SIMON BAMBERGER.

THE GOLD VALLEY MINING COMPANY OF SAN FRANCISCO,
C. C. McIVER, President; D. CUSHMAN, Secretary,
MISSION SAN JOSE, CAL., Oct. 17th, 1895.

RISDON IRON AND LOCOMOTIVE WORKS, San Francisco—Gentlemen: We take great pleasure in having to inform you that, after a careful investigation extending over a six weeks' steady run alongside of six other concentrators, the Johnston which you put in for us was the only machine from which you could not find a loss in the tailings. It has done all you claim for it and has proved more than satisfactory. We intend replacing all our other concentrators with Johnston's, as we are convinced they will pay for themselves many times over in a year. CHAS. C. McIVER, President.

The Edward P. Allis Company, Milwaukee, Wis.

Established 1860. Reliance Works.

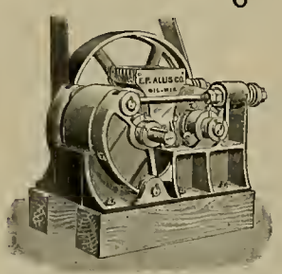
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Crushers, Rolls, Jigs, Concentrators, Screens, Stamps, Pumps, Compressors, Hoists, Boilers, Etc., Etc.

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WORK THE BEST. PRICES THE LOWEST.

The Reliance Crushing Rolls.



The Best in the World.

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Salt Lake City, Utah	73 So. Main Street.
Denver, Col.	427 Seventeenth Street.
Minneapolis, Minn.	416 Corn Exchange.
Chicago, Ill.	509 Home Ins. Building.
Kansas City, Mo.	43 Armour Building.
Pittsburgh, Pa.	German National Bank Building.
New York City	26 Cortlandt Street.
City of Mexico	Calle Gante, No. 12.

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Rock Drilling, Air Compressing, Mining and Quarrying Machinery.

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—AND—

CHROME CAST STEEL

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STAMP SHOES.



STAMP DIES.

These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

Manufactured by CHROME STEEL WORKS, Brooklyn, N. Y.

H. D. MORRIS & CO., Agents, 141 and 143 First Street, San Francisco.

Special attention given to the purchase of Mine and Mill Supplies.



Stamp Cam.

H. D. MORRIS & CO., DEALERS IN MINING MACHINERY AND SUPPLIES.

141-143 First Street, San Francisco, Cal.

MANHATTAN RUBBER BELTING, PACKING AND HOSE,
SANDERSON DRILL STEEL,
MORRIS CENTRIFUGAL PUMPS,
LIGHT STEEL RAIL.

THE OLD RELIABLE!



ALBANY LUBRICATING COMPOUND

TWENTY-SEVEN YEARS' CONTINUOUS SERVICE in the great Mines, Steamships, Railroads and Mills all over the world prove it to be

THE KING OF LUBRICANTS!

Tatum & Bowen

34-36 FREMONT ST., SAN FRANCISCO.
85 FRONT ST., PORTLAND, OR.

DEALERS IN MACHINERY, OILS, MINING AND MILL SUPPLIES, ETC.

Mining Pipe!



STEEL OR IRON.—We make pipe of either, but recommend STEEL, it being superior to iron in many particulars and inferior in none.

COATING.—We use great care in COATING our pipe with a HOT solution of Double Refined Asphaltum and Maltha.

COMPETITORS.—Our competitors say we have the best appointed Pipe Shop on the Coast.

SCHAW, INGRAM, BATCHER & CO., Hardware Merchants,
SACRAMENTO, CAL.

DEWEY & CO., PATENT SOLICITORS.

220 Market St., San Francisco, Cal.

MINE BELL SIGNALS.

Adopted, Used and In Force in Accordance with State Law.

FOR THE CONVENIENCE OF OUR READERS IN THE MINING COUNTIES WE PRINT IN legal size, 12x36 inches, the Mine Bell Signals and Rules provided for in the Voorhies Act, passed by the State Legislature and approved March 8, 1893. The law is entitled "An Act to Establish a Uniform System of Mine Bell Signals to Be Used in All Mines Operated in the State of California, for the Protection of Miners." We furnish these Signals and Rules, printed on cloth so as to withstand dampness, for 50 cents a copy. MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

Market Reports.

The Markets.

SAN FRANCISCO, Nov. 14, 1895.

In the useful metals there is a general withholding of orders that keeps prices from advancing; with the precious metals there is more steadiness. The silver quotations which are remarkably steady, do not indicate anything except that the smelting contracts with New York agencies and the London market cover so much of the bullion product as to virtually control the market till the close of the year. Probabilities are that early in '96 will see a marked advance in the white metal. The net imports of tinplate during '94 were 387,185,601 pounds; with the total domestic production of 193,801,073 pounds, the approximate consumption in the United States foots up 580,986,674 pounds. The annual capacity of mills that were completed on the 30th of last June is 450,000,000 pounds. With the mills in process of construction completed the annual capacity would be 570,000,000 pounds, within 10,000,000 pounds of the present annual consumption.

Though aluminum does not enjoy as much of an industrial "boom" as was prophesied for it some time ago, it occupies considerable prominence. There are three grades of commercial aluminum, with present New York quotations as follows:

No. 1 aluminum (guaranteed to be over 98 per cent pure) in rolling ingots—54 cents per pound in small lots; 52 cents per pound in 100-pound lots; 50 cents per pound in ton lots.

No. 1 aluminum (guaranteed to be over 98 per cent pure) in ingots for re-melting—52 cents per pound in small lots; 50 cents per pound in 100-pound lots; 48 cents per pound in ton lots and over.

No. 2 grade (guaranteed to be over 94 per cent pure aluminum, with no injurious impurities, for alloying with iron and steel) cast in ingots for re-melting—50 cents per pound in small lots; 48 cents per pound in 100-pound lots; 45 cents per pound in ton lots and over.

Aluminum castings are quoted at sixty cents per pound upward, in accordance with the number of castings, their weight, cost of molding, etc. The prices of castings of aluminum hardened with other alloying metals, the same as for pure aluminum castings. Hard aluminum castings can be furnished with a tensile strength of at least 30,000 pounds per square inch. The shrinkage of aluminum is a little more than that of brass, being 17-64 of an inch to the foot.

Finely powdered aluminum for paint, printing and other purposes (made by grinding beaten aluminum), called in the trade "Aluminum Bronze Paint," $2.25 per pound; lots of 100 pounds, $2.00 per pound; varnish for aluminum bronze paint, $1.25 per gallon.

To obtain the weight of aluminum in castings, bars, sheets, etc., divide the weight of similar pieces of copper by 3.3, brass by 3.1 and steel by 2.9.

To obtain the relative cost of aluminum sheet to copper, brass and steel sheet, multiply the cost per pound of the copper sheet by by 3.3, brass sheet price by 3.1 and steel sheet price by 2.9.

New York Metal Market.

NEW YORK, Nov. 14.—PIG IRON—Southern, 12@14.50; Northern, 12@14.00.

COPPER — Brokers', 11½c; exchange, 11.40c.

LEAD—Brokers', $3.10; exchange, $3.17½.

TIN—Straits, 14.50@14.60c.

SPELTER—Domestic, $3.75.

New York Silver Prices.

NEW YORK, Nov. 14.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30¾	67⅜	11 50	.....
Saturday	30¾	67⅜	11 60	3 10
Monday	30⅞	67¾	.....	3 15
Tuesday	30⅞	67½	.....	.....
Wednesday	30¾	67⅜	11 70	3 12½
Thursday	30⅝	67½	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.87¾
London Merchants	$4.86½
London Sight Bankers	$4.89

San Francisco Metal Market.

COPPER.			
Bolt	¼ & 5-16, 20c; ⅜ and larger, 21c		
Lake Superior Sheathing	22	@	—
Ingot, jobbing	—	@	18
Ingot, wholssale	17	@	16
Sheet copper	—	@	21
ZINC.			
Sheet	9½@		
LEAD.			
Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, " " "			1 45
Buck, Balls and Chilled, do. " " "			1 45
IRON.			
American Soft	16 00	@	18 00
Pig, per ton	18 00	@	20 00
STEEL.			
English, lb	16	@	19
ANTIMONY.			
Per lb	—	@	10½
PIG TIN.			
Per lb	15	@	16 00
QUICKSILVER.			
Home trade, per flask	39 00	@	40 —
BORAX.			
Refined, in car lots	—	@	5⅛
Refined, in sacks and barrels	—	@	5⅜
Powdered, in car lots	—	@	5⅜
Concentrated, "	—	@	4⅞

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied	Delinq't and Sale.	Secretary.
Alpha Con, Nev	15	10c	Sept 30,	Nov 5,	C E Elliott, 79 Nevada Block
Best & Belcher M Co, Nev	59	25c	Nov 4,	Dec 9,	M Jaffe, 309 Montgomery
Bullion M Co, Nev	46	10c	Nov 4,	Dec 9,	R R Grayson, 331 Pine
Bulwer Con M Co, Cal	11	5c	Oct 29,	Dec 4,	C E Elliot, 309 Montgomery
Confidence M Co, Nev	26	30c	Nov 13,	Dec 18,	A S Groth, 414 California
Chollar M Co, Nev	41	25c	Nov 12,	Dec 17,	Jan 7 C E Elliot, 309 Montgomery
Exchequer M Co, Nev	38	5c	Oct 21,	Nov 25,	C E Elliott, 309 Montgomery
Gold Bar Con M Co, Cal	2	3c	Nov 5,	Dec 21,	Jan 16 E C Godfrey, Crocker Building
Gould & Curry S M Co, Nev	77	15c	Nov 5,	Dec 10,	Dec 30 A K Durbrow, 309 Montgomery
Gray Eagle M Co, Cal	41	5c	Sept 23,	Oct 28,	Nov 22 W J Gurnett, 308 Pine
Iowa Mining Co, Nev	21	5c	Oct 23,	Nov 26,	Dec 16 R L Thomas, 419 California
Jamison M Co, Cal	7	2c	Nov 9,	Dec 16,	Jan 6 S W Cheyney, 120 Sutter
Marguerite M Co, Cal	1	10c	Nov 2,	Dec 2,	Jan 5 Chas. Winters, 237 12th St., S F
Ophir S M Co, Nev	67	25c	Nov 5,	Dec 9,	Dec 30 E B Holmes, 309 Montgomery
Occidental Con M Co, Nev	20	10c	Oct 1,	Nov 14,	Nov 25 Alfred K Durbrow, 69 Nevada Block
Superior M & M Co, Cal	1	5c	Nov 5,	Dec 9,	Dec 30 J Howard Barnard, 916 Market, S F
Yellow Jacket M Co, Nev	60	25c	Nov 12,	Dec 17,	Jan 22 W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date
Challenge Con M Co, Nev	C L McCoy, Mills Building	Nov 21
Occidental Con M Co, Nev	A K Durbrow, 309 Montgomery	Nov 18

TIN PLATE.

Per bx ..... 5 25 @ 6 00

ZINC.

Sheet ..... 8½@

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00
Greta	7 50
Nanaimo	7 00
Gilman	6 50
Seattle	6 00
Coos Bay	5 00
Cannel	8 50
Egg, hard	12 50
Wallsend	7-50
Scotch Splint	7 50
Brymbo	7 50

TO ARRIVE—CARGO LOTS.

Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

NAILS.

Wire	$3 50
Cut	3 25

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, November 14, 1895.

The depression in the market has continued throughout the week, and it looks as if this will be the rule for some time to come or until after the Hale & Norcross suit is out of the way.

Several assessments were levied the past week. Others are to follow before the close of the year. The work as now outlined in about every one points to a good many months before anything of a substantial character will be brought to light; yet the work done will be in the nature of putting the mines in a much better condition for working after they find and develop a large body of good to high grade ore.

From the Comstock mines both private and official advices continue of an important character; yet it points to further time before anything deserving of notice is brought to light. While exploiting several of the mines ore is extracted, but not in sufficient quantity to cover current expenses. Some of the ore runs up to around $75 a ton, and if the stringers now being followed should develop into a lode several feet wide dividends could be looked for, but instead of widening they pinch out. In the Alta group the work is in an advanced condition, and it should not cause surprise if quite a body of good ore is developed. Everything at present points in that direction; yet it may take more time than expected by those in position to know. In the Gold Hill group work is being done in a lifeless, half-hearted way, as if the managers feared the money would give out too soon and they could not collect assessments fast enough to pay current expenses. Even as it is, the assessments come fast enough. The past week Confidence and Yellow Jacket were assessed. These will be followed by others in that group. The work being done in these mines should not be ignored. It means before the first half of 1896 passes by quite an ore development, but whether a stock deal can be promoted on it is problematical. It certainly can not until moneyed insiders come in and do it. They are still pushing west in Seg. Belcher, Belcher, Crown Point, Yellow Jacket, Confidence, Challenge, Con. Imperial and Alpha. This work is being closely watched, for if properly done it is confidently expected that better results will follow than has for many years; yet many months may pass by before this can be known with any degree of positiveness.

In the middle group ore extracting continues, but not on a sufficient scale to attract attention. The small leads which are being followed are not of sufficient importance to justify any movement, outside of manipulation, in the share market. It now looks as if work will have to be pushed lower down before anything of importance will be found and developed. In Gould & Curry and Best & Belcher the work continues of a dead character—getting the mines into good condition for more advantageous working next year. In Con. Virginia the work on the 1000-foot level gives promise of better things than have been brought to light for many years, yet time and money will be required in prosecuting the work. An assessment will probably be a necessity. In Ophir and Mexican the work on the upper levels and also on the 1465-foot level is being done in a fairly active way; still it looks as if the managers are trying to avoid finding an ore body. Perhaps such an event might frighten them so very badly that life might be despaired of. In Union and Sierra Nevada the work being done is of an interesting character, yet it looks as if considerable more time will be required before anything of importance is found.

In the outside districts nothing of importance is being done outside of the Bodies. Our advices from this district are quite important and indicate that before next spring they are liable to uncover enough ore to re-oew dividends by at least two of the mines.

The following illustrates the changes of the week:

Mines.	Nov. 7.	Nov. 14.
Alpha	.....	$ 35
Alta Consolidated	.....	12
Andes	$ 31	29
Belcher	.....	30
Best & Belcher	75	71
Bodie	32	39
Bullion	13	10
Challenge	.....	36
Chollar	38	25
Confidence	1 40	1 10
Consolidated California and Virginia	2 50	2 50
Consolidated New York	.....	.....
Crown Point	.....	28
Exchequer	.....	.....
Gould & Curry	38	33
Hale & Norcross	.....	1 35
Justice	.....	05
Mexican	58	52
Ophir	1 30	1 30
Overman	.....	13
Potosi	60	52
Savage	50	41
Sierra Nevada	83	78
Union	64	62
Utah	07	05
Yellow Jacket	33	26

San Francisco Stock Board Sales.

SAN FRANCISCO, Nov. 14, 1895.

9:30 A. M. SESSION.

300	Alpha	35	400	Mexican	52
50	Andes	29	100	Mono	12
100		28	1000	Occidental	29
50	Benton	40	500		28
200	Best & Belcher	71	600	Ophir	1 30
250	Bodie	39	100	Overman	12
100	Bullion	10	200		13
200	Challenge	36	200	Savage	40
750	Chollar	25	100	Sierra Nevada	78
100	Confidence	1 10	200		77
300	Crown Point	28	500	Union	61
250	C. C. & Va	2 50	200		62
200		2 45	650	Yellow Jacket	25
150	Gould & Curry	33	300		26
500	Hale & Norcross	1 35			

SECOND SESSION—2:30 P. M.

750	Ophir	1 20	300		28
25		1 15	100	Confidence	1 00
100	Mexican	46	100	Sierra Nevada	73
100	Gould & Curry	31	200		74
20	Con Cal & Va	2 35	300	Utah	05
50		2 40	200	Bullion	10
100	Savage	41	100	Overman	12
100		40	50	Justice	05
200	Chollar	25	400	Union	56
300	Potosi	52	400	Alta	12
150	Yellow Jacket	25	450	Challenge	35
600	Con Imperial	03	200		34
300	Alpha Con	28	50	Occidental	26
550		26	100	Andes	28
300		27	250	Bodie	36
100	Belcher	30			

Assessment Notices.

BEST & BELCHER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the fourth (4th) day of November, 1895, an assessment (No. 59) of twenty-five cents (25 cents) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the ninth (9th) day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

M. JAFFE, Secretary

Office—Room 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

CONFIDENCE SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 13th day of November, 1895, an assessment (No. 26) of 30 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, No. 414 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of December, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on WEDNESDAY, the 8th day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

A. S. GROTH, Secretary.

Office—No. 414 California street, San Francisco, California.

Assessment Notices.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of November, 1895, an assessment (No. 46) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 20, No. 331 Pine street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office—Room 20, No. 331 Pine street, San Francisco, California.

SUPERIOR MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Placerville, El Dorado county, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the fifth day of November, 1895, an assessment (No. 1) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 916 Market street, Room 81, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of December, 1895, will be delinquent and advertised for sale at public auction; and un ess payment is made before, will be sold on WEDNESDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. HOWARD BARNARD, Secretary.

Office—Room 81, 916 Market street, San Francisco, California.

MARGUERITE GOLD MINING AND MILLING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Auburn, Placer county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the second day of November, 1895, an assessment (No. 1) of 10 cents per share was levied upon the whole of the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, 237 Twelfth street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second day of December, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the fifth day of January, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

CHAS. WINTERS, Secretary.

Office—237 Twelfth street, San Francisco, California. Office hours from 4 to 6 o'clock P. M. Bring your certificate.

THE JAMISON MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, on Jamison Creek, near Johnsville, Plumas County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the ninth day of November, 1895, an assessment (No. 7) of two cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 120 Sutter street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of December, 1895, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on MONDAY, the 6th day of January, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

SAM W. CHEYNEY, Secretary.

Office—Room 50, 120 Sutter street, San Francisco, California.

GOLD BAR CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1895, an assessment (No. 2) of three c nts per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Rooms 37 and 38, Crocker Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of December, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on THURSDAY, the 16th day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. C. GODFREY, Secretary.

Office—37 and 38 Crocker Building, San Francisco, California.

IOWA MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia City, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the 23d day of October, 1895, an assessment (No. 21) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 2, No. 419 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of November, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on MONDAY, the 16th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

R. L. THOMAS, Secretary.

Office—Room 2, 419 California street, San Francisco, California.

GOULD & CURRY SILVER MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1895, an assessment (No. 77) of Fifteen (15) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of December, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

WANTED.—POSITION AS ASSAYER OR Amalgamator. Capable to take charge of mine and mill. Over 25 years experience.

C. S. A., 1212 So. O Street, Tacoma, Wash.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING NOVEMBER 5, 1895

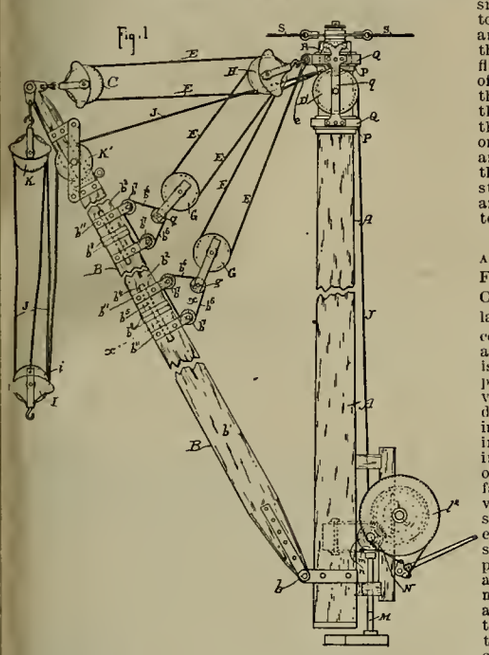
549,305.—FAUCET—W. H. Barnes, Tucson, A. T.
549,308.—PUMP AND SADDLE POST—Blackman & Cope, S. F.
549,366.—STEAM BOILER—J. Bonner, Tiburon, Cal.
549,236.—AMALGAMATOR—G. A. Gellen, S. F.
549,292.—FISHING ROD—C. Kewell, S. F.
549,375.—BOX MACHINE—J. G. Lettelier, Los Angeles, Cal.
549,455.—LOG ROLLER—E. J. Metzler, Baker City, Or.
549,151.—TREATING GYPSUM ROCK—G. W. Parker, S. F.
549,234.—JOINT AND BEARING—W. C. Rarig, S. F.
549,245.—OIL EXTRACTOR—R. I Schroeder, Sacramento, Cal.
549,168.—ROTARY ENGINE—Thomas & Brumagin, Portland, Or.
549,301.—NAILING MACHINE—S. Wilde, Woodland, Cal
24,859.—DESIGN FOR LAMP CHIMNEY—H.S. Maltby, Santa Cruz, Cal.
24,864.—DESIGN FOR KEY RING, ETC.—J. W. Ogilbee, Portland, Or.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

DERRICK.—Orange M. Loveridge, Weaverville, Cal. No. 548,375. Dated Oct. 22, 1895. The object of this invention is to provide a derrick which is adapted, by reason of its adjustable boom, to easily reach and to be connected with loads close by the mast, and as far out as the length of said boom directed horizontally from the mast. This adaptability, in conjunction with the extension of the boom, makes it possible for a large radius of ground to be worked over without having to move the derrick, thus adapting the device for the particular use of raising large rocks and boulders out of hydraulic mines. A further object is to provide a derrick the swinging boom and the hoisting mechanism of which may be readily operated, the latter at different speeds, and the various parts may adjust themselves without cramping. To attain these objects the boom is pivotally connected with the mast and is provided with operating mechanism whereby it is moved to various points through an arc in a vertical plane, thereby throwing its upper end, from which the load carrier is suspended, to different points in vertical planes. The boom is also extensible by means of novel construction.


Fig. 1

AMALGAMATOR.—Rodney Wing, Butte, Montana, assignor of one-half to Jonathan C. Baker of same place. No. 548,792. Dated Oct. 29, 1895. The object of this amalgamator is to provide a simple and effective device for amalgamating gold and to catch quicksilver, said device being adapted for use in gold and silver mills, or in connection with concentrators, or for saving fine gold in gravel mining. The amalgamator consists of a pan, the body of which is composed of longitudinal and transverse electroplated or quicksilvered plates set on edge and fitted together to form independent vertically disposed cells, said plates terminating short of the bottom of the pan and having on their lower edges shelves adapted to catch the material and increase the contact surface, and facilitate the distribution of the material over the bottom of the pan. By the use of this pan all the material, especially the slimes and the water which contain float gold, quicksilver or amalgam, must come a number of times in contact with the amalgamating surfaces while passing through the machine, and this, assisted by the motion which is imparted to the pan, increases the amalgamating effect, thereby increasing the saving of floating gold, quicksilver, amalgam, or any precious metals susceptible of amalgamation, held in suspense during the process of wet milling of gold or silver ore, or sluicing in gravel mining.

BUTTER MOLDING AND CUTTING MACHINE.—Rufus A. Simpson, Ferndale, Cal. No. 548,821. Dated Oct. 29, 1895. The object of this invention is to provide an apparatus for the cutting of masses of butter into rectangular blocks having a given weight, such as is used in marketing and retailing the butter. It consists of a box having removable sides and bottom, into which the buttor is packed; means for dividing the butter, both horizontally and vertically to form packages, and removable bottom boards having a width equal to the thickness of the rolls; means for removing cutter-head so as to separate the butter resting upon the adjacent bottom board, after which it may be withdrawn and the bottom boards allowed to drop from their position. In conjunction with this mechanism is a transversely slidable carrier having vertical cutting wires extending from side to side and adapted to separate transversely the packages successively from the mass within the mold.

DENTAL MOUTH MIRROR.—Frank L. Platt, San Francisco, Cal. No. 548,817. Dated Oct. 29, 1895. The object of this invention is to provide a dental mouth mirror capable of holding the lips apart, holding the cheek away from the molar teeth, retaining a napkin in the cheek and on the tongue to assist in keeping the teeth dry, acting as a shield to the lips and cheek to prevent their being wounded by the use of other instruments and keeping the tongue away, said mirror being so bent with respect to its handle as to avoid interference with the hand with a full and free transmission to and reflection of light from its surface when in use, and being also provided with a guard for its protection against injury from the corundum wheel. The invention consists in a handled mirror, provided on each side with a wing or flange adapted to hold the lips apart and to retract and hold the cheeks away from the molar teeth. These wings or flanges are the essential feature of the mirror. Other features are the shape of the mirror and handle, the relative positions of the two, the shape and location of the wings or flanges, a radially adjustable and removable guard for protecting the face of the mirror from the stone in grinding the crowns, and an easily applicable guard for the tongue.

ADJUSTABLE SIGHT FOR FIREARMS.—Frederick W. Dohbell, San Francisco, Cal. No. 548,801. Dated Oct. 29, 1895. This invention relates to that class of firearm sights commonly known as "peep" sights, and in which the sighting aperture is formed in the center of a comparatively large disk adapted to a vertical adjustment upon the standard in which it is mounted. The invention comprises a mechanism including a slide having a fixed indicator or mark, and a disk thereon having range graduations on its face, to be brought into alignment with the mark or indicator on the slide, said disk being rotatable to effect the range adjustment of the sight, whether said sight be a peephole in the center or a sight aperture independent of, though moved by, the disk, or both. It also comprises a means by which the disk may be initially adjusted to bring its graduations to proper coincidence with the fixed lines or pointers whereby they are read. The chief object of the device is to provide for the rapid, smooth and accurate adjustment of the sight to the several ranges, and which may be conveniently operated by the thumb of the right hand without aiming the gun. Other objects are to provide for proper adjustments to enable graduations, to register accurately, and also to provide the combination of two sights, one of which may be used for target shooting and the other for hunting, and both of which are readily adjustable.

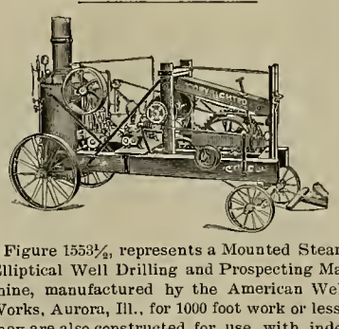


Figure 1553½, represents a Mounted Steam Elliptical Well Drilling and Prospecting Machine, manufactured by the American Well Works, Aurora, Ill., for 1000 foot work or less; they are also constructed for use with independent Steam, Gasoline or Horse Power; will handle as successfully and rapidly the Hydraulic, Jetting, Rotary, Cable, or Pole drilling tools, making it one of the best all-purpose drilling machines manufactured.

Every owner of a traction engine should have one of these machines, with which he can make a larger per cent of profit for capital invested than in any other way.

The manufacturers would like to correspond with any parties who wish to purchase a really practical machine.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice. There are delinquent upon the following described stock, on account of assessment (No. 37) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$100 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	451	2,825	282 50
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	502	200	20 00
Alex. McLaughlin, Trustee	500	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	55	5 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,075	107 50
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 10
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	493	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	362	100	10 00
H. H. Noble, Trustee	523	4,000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on November 2, 1895, the above sale is postponed to MONDAY, the 2d day of December, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

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ANNUAL MEETING.—THE REGULAR ANNUAL MEETING of the stockholders of the Occidental Consolidated Mining Company will be held at the office of the company, room 69, Nevada Block, 309 Montgomery street, San Francisco, California, on MONDAY, the 18th day of November, 1895, at the hour of one o'clock, P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, November 15, 1895, at 3 o'clock P. M.

ALFRED K. DURBROW, Secretary.

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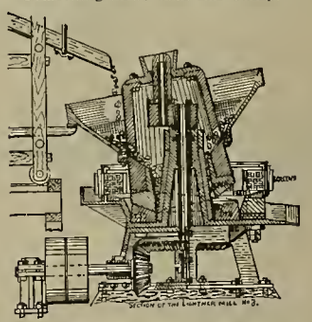
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Assay Office, Sampling Works

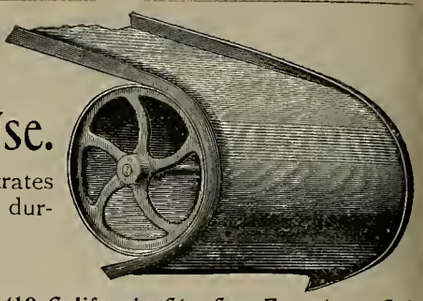
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MINING AND SCIENTIFIC PRESS.

AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 21. SAN FRANCISCO, SATURDAY, NOVEMBER 23, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

An Electric Mining Plant.

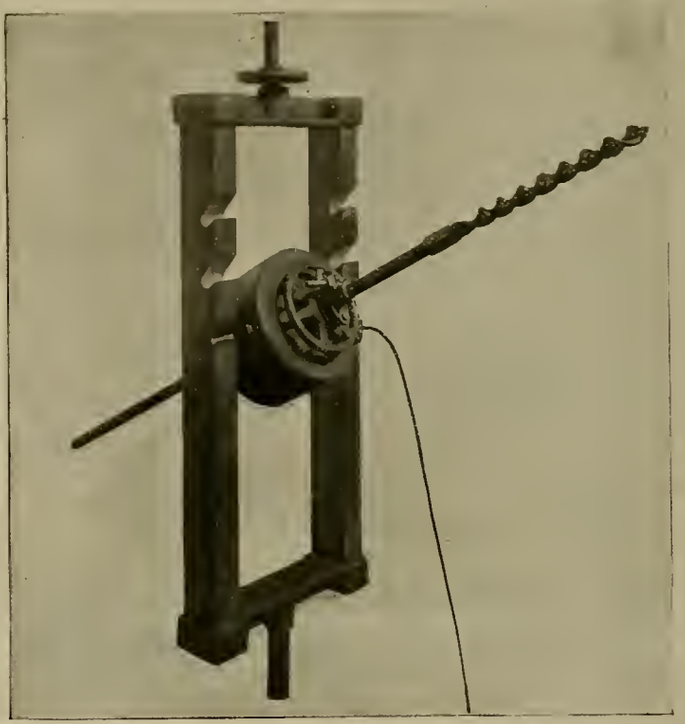
Pennsylvania occupies the same pre-eminence in coal mining that California does in gold mining. When the mining world wants to know what is the latest and best method and apparatus for gold mining these columns are culled; so, when up-to-date information is desired about coal mining we look to a Pennsylvania mining journal for information.

Interesting to all underground workers, whether for gold, silver, copper or coal, is an account of an electric mining plant recently installed by the Link Belt Machinery Co., in No. 2 and No. 3 mines, of the Essen Coal Co., at Hazeltine, near Pittsburg, the largest plant of the kind in the United States. D. N. Osyor, the mining engineer of the Link Belt Machinery Co., superintended the work of installation.

One of the accompanying illustrations depicts one of the two 80 H. P. locomotives coming out of the mine. These electric locomotives are used for the principal haulage; the primitive mule is still depended on for motive power in gathering and other lighter haulage. The locomotives attain a speed of about eight miles an hour, exert about 3800 pounds drawbar pull and can daily haul 1200 tons of coal a distance of 3500 feet.

The chain breast machines, or "Independent" coal cutters, are sixteen in number at present. Each cutter is two feet high, 2 feet 4 inches wide and 10 feet 5 inches long, cutting a depth of five feet. The frame is steel and wrought iron; the sockets, socket pieces and chain are cast steel. Power is furnished the coal cutter by a 20 H. P. motor wound for 250 volts with one field coil. By an ingenious lever attachment the cutter can be reversed, stopped or fed forward without stopping the motor.

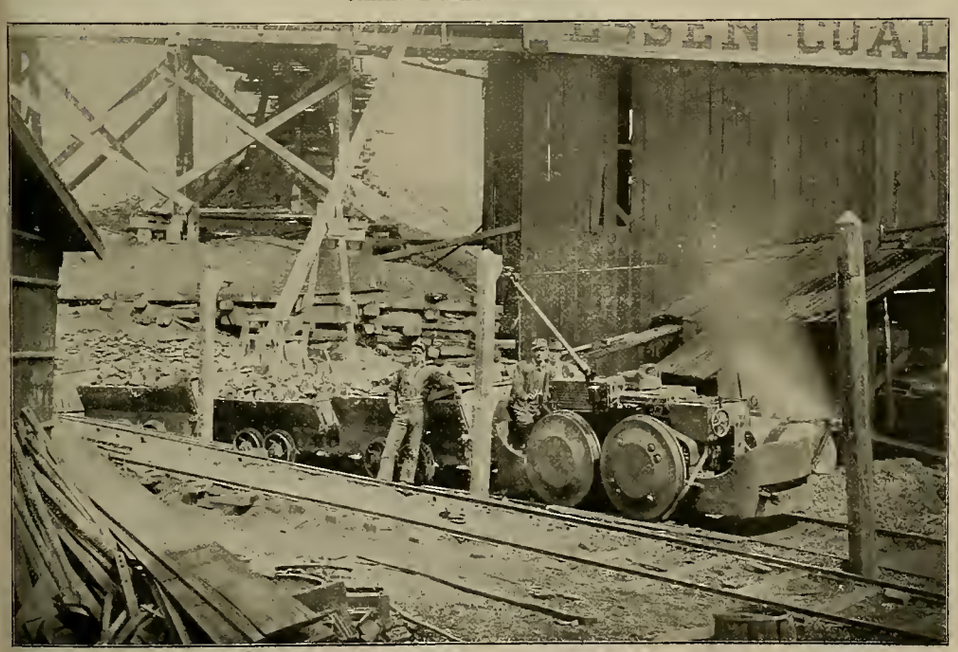
The Gearless Electric Drill is an important part of the plant, and, as previously described, performs effectual service. It is evident from the result that the point sought has been attained, viz.: sufficient power so directed as to make the cost of delivering the coal on board the railway cars such a figure as would admit of profit in the face of the fiercest competition. The Pennsylvania coal miner is handicapped as compared with the California gold miner; here there is no competion, transportation of the refined product cuts no figure; the world is the market; there is but one price; every particle procured is eagerly sought after; it requires no advertising or solicitation. In the case of coal, in such a region as western Pennsylvania and eastern Ohio, where coal is delivered at $1.00 per ton, such adverse conditions prevail as to render necessary the closest economy to keep in operation. The fact that the plant briefly noted here fills such rigid requirements is sufficient evidence of its practical utility.



GEARLESS ELECTRIC DRILL.



CHAIN BREAST MACHINE.



LOCOMOTIVE COMING OUT OF MINE.

Being asked "What is the outlook for steel rails, since that is the largest single channel of consumption for steel?" Andrew Carnegie says: "The railway system of the country is practically developed. We can never expect again to build railways at the rate of 13,000 miles a year. There are more rail mills than will ever be employed on rails, and some that never should have been built. The rail mills must now adapt themselves to other purposes as well as rails. No doubt the consumption of rails next year will be greater than it has been for two or three years, but not sufficient to keep the rail mills all busy upon rails." An opinion from another point of view is now in order and would certainly be of equal value.

Nothing better illustrates the present activity in the mining world than the springing up of so many new mining papers. Every week come two or three new candidates for popular favor. From Oregon is received four new publications, each devoted primarily to mining intelligence. In this, as in other departments, accuracy and reliability are essential, and should be made the prime factors in the enterprise. The city dailies, especially the *Call*, are also devoting increased space to the mining interests of the State, all of which helps to advertise our mineral resources and aid in the general good.

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J. F. HALLORAN.....General Manager

San Francisco, November 23, 1895.

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THE plan suggested by Geo. Johnston in last week's issue of settling the mineral land question is commented on by a prominent officer of the California Miners' Association as "a business basis of settlement of an ordinary business question by business men." Two bills with the same intent were introduced at the last session of the 53rd Congress, one by Congressman Caminetti, the other by Senator White; neither got any farther than the committee room.

IN the flush days of timber location and purchase in Oregon and Washington, in '87, '88 and '89, it was not uncommon for a little paper, started with a hand press and a hatful of type, to have in its third or fourth issue seventy-five or eighty notices of application to purchase timber land, for which it received $10 each. The fourteenth issue of the Cripple Creek *Mail* to hand has 104 applications for patents for mining claims, which indicates considerable mining activity in that region.

TO THOSE who argue that mining is only ephemeral, and not to be regarded as a permanent industrial feature of any locality, is commended notice of the recent celebration at the Eisenzecher Zug mine, near Siegen, Germany, of the four hundredth year of its continuous working. It was opened in 1495, and has been almost steadily operated ever since. If there is any one permanent, abiding industry on the face of the earth, or in the crust thereof, it is mining. The Siegen mine owners, in step with the progress of the age, have resolved to discard present primitive appliances and will put in a modern plant, to work and light the mine by electricity. When, iu 2295, the eight hundredth anniversary is celebrated there will doubtless be further development of natural forces that will make our nineteenth-century mining operations seem primitive as viewed through the haze of the centuries.

IN another column, "Prospector" has some sarcastic remarks about the neglect or inability of San Francisco business men to take hold of promising mining properties. While every proposition offered is not eagerly embraced, it is doubtful if there is another city in the world of any size where a larger proportion of the business men resident therein have investments in adjacent mines. It is often the fashion through the years to sneer at San Francisco's slowness to invest in mines, and occasionally there is some foundation for scoffing on the part of those who fail to interest capital; yet, through the years, it is noticed that San Francisco business men have usually stood ready to invest in mining propositions and to carry many a good man with a good mine till he was able to carry himself.

THE monometallic league or "sound money" advocates, who desire to influence public opinion through the press, continue to send us weekly brochures showing how the country is in danger of being ruined unless Messrs. Cleveland, Carlisle and the other members of the bond syndicate save the nation from the machinations of the wicked silver miners who are interested only in securing a market for their accursed silver and who care nothing for the prosperity of our beloved country. Indeed, the only real patriots are the gentlemen who buncoed Uncle Sam out of $10,000,000 in the recent bond deal. Among the closing sentences of the last "expose" of these bad silver men to hand is this gem: "Our country really is not interested iu silver except that a very few of our people are engaged in mining." This excerpt is given as a sample of the kind of stuff supplied by "the sound currency committee of the Reform Club; publication office, 52 William street, New York." The sentence quoted needs no answer. It illustrates how little those who sent it out understand the question they attempt to discuss. The constant reference to "silver barons," and the silver output of Nevada, etc., shows also the belief (which is generally shared in the East) that the Comstock was and is purely a silver-producing proposition. The official report published on page 342 of this issue is sufficient answer to that; in that report, Superintendent Lyman of the Con. Cal. and Va. M. Co. gives the eutire yield of that mining company's property to October 1st, 1895, as aggregating $131,425,074.33; and of this amount $69,753,805.92 was silver, and $61,672,168.41 was GOLD. The proportion of gold and silver on the Comstock was a very fair one. Nature there made a just effort in the direction of bimetallism, and the Supreme Intelligence which created that metallic deposit of the two metals seemed to understand the currency requirements of humanity better than the sound currency committee of the Reform Club of William street, New York.

MUCH has been written of "deep level" mining in the Rand, South Africa, district. What may, however, justly be styled "deep level" mining is well exemplified in gold quartz mines in this State, among others the Champion and Providence mines in Nevada county. This week the shaft in the latter mine has attained a depth of 1800 feet. There are many deeper shafts on this coast, some in the State of Nevada a thousand feet deeper, but the one mentioned is a good illustration of profitable gold mining at great depth. At the depth of 1780 feet a drift has been run 600 feet on the front ledge, which is six feet of heavily sulphuretted ore. A crosscut run 400 feet on the back ledge at the same depth shows a ten-foot ledge of equally good ore. On the 1350-foot level ore yielding free gold is being worked. Sulphurets increase with depth. This mine is not specially mentioned as an isolated or unusual case. It has been worked for over twenty years, has yielded millions, and recent indications show it good for as many more years and millions. Here, in California, it is taken as a matter of course, nothing unusual or wonderful; there being many more just such properties. Were one or two of these big gold producers showing great ore values at 1800 feet depth in other States or countries, they would be advertised and heralded as something great and unexcelled, and the attention of the world called to the fact. In the Golden State, where the usual is not contrasted with the occasional, the Providence is simply viewed as a phase of the business; in some places the gold is placer, and to be hydraulicked; in others drift, cement capped; in others in the quartz at great or little depth, but nothing to make a fuss over. It has sometimes, however, seemed that maybe it would be better for California to give greater prominence to such great permanent gold producers as the Providence (which, by the way, is not on any list, nor is there any stock for sale). Eastern press comment and Eastern letters evince a general idea that California is a by-gone factor in the gold product, when as a matter of fact it can be quietly said, without the slightest exaggeration that California is to-day foremost in gold mining and milling methods, is supplying the rest of the gold mining world with the brightest, brainiest mining men in every department, and that the $1,500,000,000 or $1,600,000,000 that California has added to the gold output of the world bears the same relation to the amount of gold within her borders that an index does to the volume whose contents it indicates.

REFERENCE was made in last week's issue to a recent Colorado decision affecting the rights of tunnel locators, regarding which further inquiry has been made. The case referred to was the Rico-Aspen. The Enterprise Mining Co. owned the group tunnel and tunnel site in Dolores Co., in which was discovered a blind vein not known to exist when the tunnel site was located. The vein was called Jumbo No. 2. The Rico-Aspen Con. Co. owned a surface lode claim, the Vestal, which ran parallel to the line of the tunnel, its nearest corner being over 300 feet distant. The course of "Jumbo No. 2" was almost at right angles to the tunnel line, and, after crossing the Vestal claim extended into the Jumbo claim, also owned by the Enterprise people. In July, '87, the Group tunnel was located; the tunnel had been run 400 feet when the Vestal was located; application for a patent to the latter was made in 1890 and patent issued in February, '92. At the time of application, "Jumbo No. 2" had not been discovered, the date of its discovery being September 1, '91, through a shaft 800 feet from the tunnel line, the tunnel being then in 1500 feet. In June, '92, the Jumbo vein was cut in the tunnel 1920 feet from its mouth. The Enterprise claimed "Jumbo No. 2" because of its tunnel location, discovery and subsequent location: the Rico-Aspen, owners of the Vestal, claimed it because of location and prior discovery within their limits. The court ruled that the owner of the tunnel was the owner of the lode within the Vestal claim. The court's decisions were to the effect that the locator of a tunnel site has the right to the possession of every blind vein or lode which crosses the line of the tunnel within 3000 feet from its face, that was not known to exist when the tunnel was located, contingent only upon the diligent prosecution of the work on the tunnel and the discovery of the vein or lode therein: that a discovery of such vein or lode from the surface and a location thereon, after the location and commencement, of the tunnel, will not deprive the owner of the tunuel of any part of the vein which he covers by his surface location made after his discovery of the vein in the tunnel, if he has diligently prosecuted his work on the tunnel: that the owner of such tunnel is entitled to 1500 feet along such lode or vein, and this length may be taken up, having as many feet as he desires upon each side of his point of discovery in the tunnel: that the owner of a tunnel claim when a blind vein or lode has been discovered in the tunnel should adverse and litigate the application for a patent by the owner of a surface lode claim covering the same vein or lode. When, however, it is manifestly impossible for such owner of a tunnel claim to know that the blind vein exists in his tunnel, or, if discovered, that it is within the territory of a surface lode claim for which a patent is applied for, he will be excused from adversing such patent application, and he will lose none of his rights by such failure: that to entitle the locator of a tunnel site to blind lodes which he may discover in running his tunnel—he must push work on his tunnel diligently. He cannot cease work for six months or for one month and then recommence: work must be prosecuted on the tunnel diligently, and if it is not, rights to veins or lodes in the tunnel, discovered after the owner ceases to prosecute work diligently, are forfeited, and they may be located from the surface by others: he has no right to any vein or lode which was discovered before he located his tunnel, or, which, undiscovered, lies within a properly located lode claim that was located before the location of the tunnel site and the commencement of work upon it, and that there is no authority given by the statute to the locator of a tunnel site to run his tunnel through a lode claim properly located prior to the location of his tunnel site and the commencement of work upon it, whether the lode claim is pat-

ented or not. This matter has been ruled on by a California court and substantially to the same effect, the circumstances in the two cases being sufficiently similar to make the litigation and result almost identical.

California's Mineral Products.

The mineral products of this State in '92 aggregated $16,000,000 in value; in '93, $18,806,261; in '94, $20,203,294, a good showing for "dull times," and the best comparative showing of any industry in this State or on this coast.

Following is a table by counties of the gold and silver product of California for 1892:

County.	Gold.	Silver.	Total.
Amador	$1,210,383 45	$8,007 99	$1,218,391 44
Butte	316,998 50	610 00	317,608 50
Calaveras	794,531 31	24,441 32	818,972 63
Del Norte	4,102 00	...	4,102 00
El Dorado	198,321 54	...	198,321 54
Fresno	106,987 00	6 00	112,987 00
Humboldt	87,515 25	...	87,515 25
Inyo	13,930 31	35,995 34	49,925 65
Kern	107,738 92	72 49	107,811 41
Lassen	15,400 00	...	15,400 00
Los Angeles	219,204 00	...	219,204 00
Mariposa	81,011 94	67 14	81,079 08
Merced	445 96	...	445 96
Mono	396,296 85	70,006 59	466,303 44
Napa	795 69	22,893 47	23,689 16
Nevada	1,945,406 31	8,325 72	1,953,732 03
Orange	9,470 00	...	9,470 00
Placer	1,159,079 60	2,119 74	1,161,199 34
Plumas	432,294 62	11,730 84	444,025 46
Sacramento	121,900 00	...	121,900 00
Santa Barbara	896 00	...	896 00
San Bernardino	47,037 00	67,072 27	114,109 27
San Diego	396,517 98	2,050 75	398,568 73
San Luis Obispo	1,097 00	...	1,097 00
Shasta	574,832 88	7,977 29	582,810 17
Sierra	688,464 30	26 11	688,490 41
Siskiyou	1,013,331 78	56 16	1,013,387 94
Stanislaus	14,190 60	...	14,190 60
Trinity	1,466,603 05	168 33	1,466,771 38
Tulare	24,355 38	11 28	24,366 66
Tuolumne	1,092,549 55	911 83	1,093,461 18
Yuba	44,217 80	...	44,217 60
Totals	$12,571,900 57	$262,550 46	$12,834,451 03

For purposes of comparison is appended the gold and silver product of California for 1893:

County.	Gold.	Silver.	Total.
Amador	$1,505,973 98	$5,230 56	$1,511,204 54
Butte	307,350 53	5,503 56	312,854 14
Calaveras	1,669,132 95	121 80	1,669,314 75
Colusa	300 00	...	300 00
Del Norte	10 352 00	...	10,352 00
El Dorado	294,610 26	1,219 80	295,830 06
Fresno	7,118 79	...	7,118 79
Humboldt	66,353 61	...	66,353 61
Inyo	25,944 67	52,474 62	78,419 29
Kern	83,665 72	1,754 00	85,419 72
Los Angeles	14,200 00	...	14,200 00
Madera	150,696 53	314 24	151,010 77
Mariposa	164,116 17	307 00	164,423 17
Mono	293,637 39	11,401 11	305,038 50
Nevada	2,067,203 22	1,229 27	2,068,432 49
Placer	1,351,249 70	616 00	1,351 865 70
Plumas	362,488 05	13 50	362,501 55
Riverside	42,412 41	...	42,412 41
Sacramento	90,090 57	...	90,090 57
San Bernardino	158,000 00	447,020 00	605,020 00
San Diego	105,860 33	...	105,86 0 33
San Luis Obispo	600 00	...	600 00
Sbasta	500,407 01	8,577 26	508,984 27
Sierra	830,343 15	45 50	830,388 65
Siskiyou	799,108 07	...	799,108 07
Stanislaus	150 00	...	150 00
Trinity	1,122,994 50	...	1,122,994 50
Tulare	12,818 00	...	12,818 00
Tuolumne	354,734 72	1,392 50	356,084 22
Yuba	30,839 27	...	30,839 27
Totals	$12,422,811 60	$537,157 77	$12,959,969 37

It will be observed that the gold product of 1893 was $149,088.97 less than that of '92, and that the silver production of '93 was $274,607.31 more than that of '92. The gross yield of the combined gold and silver was $125,518.34 more in 1893 than in '92. In '93 the increase and decrease by counties of their gold and silver production is shown by the following table:

County.	Increase.	Decrease.
Amador	$292,813 10	...
Butte	...	$ 4,754 36
Calaveras	850,342 12	...
Colusa	...	300 00
Del Norte	6,250 00	...
El Dorado	97,508 53	...
*Fresno	...	105,856 21
Humboldt	...	21,161 64
Inyo	28,493 64	...
Kern	...	22,391 69
Lassen	...	15,400 00
Los Angeles	...	205,004 00
*Madera	151,010 77	...
Mariposa	83,344 00	...
†Merced	...	445 96
Mono	...	161,264 94
†Napa	...	23,689 16
Nevada	114,700 46	...
Orange	...	9,740 00
Placer	190,666 34	...
Plumas	...	81,523 91
Riverside	42,412 41	...
Sacramento	...	31,809 43
Santa Barbara	...	896 00
San Bernardino	491,910 73	...
San Diego	...	292,708 40
San Luis Obispo	...	497 00
Shasta	...	73,825 90
Sierra	141,898 24	...
Siskiyou	...	214,279 89
Stanislaus	...	14,040 60
Trinity	...	323,776 88
Tulare	...	11,548 66
Tuolumne	...	737,396 96
Yuba	...	13,378 53

*Madera county formed from Fresno in February, 1893.
†No returns for 1893.

Recent reliable statistics to hand give the gold and silver product of California for the year 1894:

County.	Gold.	Silver.	Total.
Amador	(1)1,331,916 54	$280 27	$1,332,196 81
Butte	473,672 65	...	473,672 65
Calaveras	2,119,365 67	5,182 80	2,124,548 47
Del Norte	8,000 00	...	8,000 00
El Dorado	366,707 67	356 00	367,063 67
Fresno	8,302 00	...	8,302 00
Humboldt	41,326 00	13 86	41,339 86
Inyo	52,658 91	83,640 00	136,278 91
Kern	310,706 91	39,700 00	350,406 91
Lassen	35,283 00	...	35,283 00
Los Angeles	34,500 00	...	34,500 00
Madera	167,791 60	180 00	167,971 60
Mariposa	153,707 51	38 75	153,746 26
Merced	762 50	...	762 50
Mono	358,824 46	11,549 12	370,373 58
Monterey	8,000 00	...	8,000 00
Nevada	1,830,154 80	475 51	1,830,630 31
Placer	1,851,214 52	664 37	1,851,878 89
Plumas	499,358 83	...	499,358 83
Riverside	93,322 50	...	93,322 50
Sacramento	70,326 00	...	70,326 00
San Bernardino	130,413 78	148,242 89	278,602 67
San Diego	266,408 73	189 60	266,598 33
San Luis Obispo	1,200 00	...	1,200 00
Shasta	617,436 68	5,032 31	672,468 99
Sierra	604,721 54	...	604,721 54
Siskiyou	760,781 83	...	760,781 83
Stanislaus	26,368 50	...	26,368 59
Trinity	1,012,665 84	325 00	1,012,990 84
Tuolumne	547,448 06	1,072 16	548,520 22
Yuba	107,480 20	...	107,480 20
Unapportioned (2)	32,568 06	388 91	32,957 57
Totals	$13,923,281 89	$297,331 55	$14,220,613 44

(1) Based on returns at San Francisco mint.
(2) "Unapportioned" includes product of single mines, etc., in counties, so as to conceal their identity; and also includes estimates of product of properties known to be working, but from which no returns were obtained.
Counties not mentioned in this third list ('94) made no returns for 1894.

The above tables are compiled from official statistics from the U. S. Mint and State Mining Bureau and are as exact as careful effort, extensive inquiry and intelligent co-operation can make them. It is believed that complete returns from all the 57 counties of the State—31 of which are represented above—would largely augment the sum total. The figures are the result of months of correspondence and patient effort to get at least an approximate statement. In every instance the total is rather under than over, the idea being to make quantity secondary to accuracy.

It will be noticed that the gold product of this State was $149,008.97 less in '93 than in '92; and that the gold product of '94 was $1,351,381.32 more than in '92, an increase of $1,500,470.29 over '93. It is believed that the gold output of the State for the current year will show an aggregate of between $15,000,000 and $16,000,000. In 1894 the increase and decrease by counties of their gold and silver production, in comparison with '93, is shown by the following table:

County.	Increase.	Decrease.
Amador	...	$179,107 73
Butte	$160,818 51	...
Calaveras	455,233 72	...
Del Norte	...	2,352 00
El Dorado	71,233 61	...
Fresno	1,083 21	...
Humboldt	...	25,213 75
Inyo	57,859 62	...
Kern	264,987 19	...
Lassen	35,283 00	...
Los Angeles	20,300 00	...
Madera	16,960 83	...
Mariposa	...	10,676 91
Merced	762 50	...
Mono	55,335 08	...
Monterey	8,000 00	...
Nevada	...	237,802 18
Placer	500,013 19	...
Plumas	136,857 28	...
Riverside	50,910 09	...
Sacramento	...	19,764 57
San Bernardino	...	326,357 33
San Diego	150,738 00	...
San Luis Obispo	600 00	...
Shasta	113,484 72	...
Sierra	...	225,667 11
Siskiyou	...	38,326 24
Stanislaus	26,218 50	...
Trinity	...	110,003 66
Tuolumne	192,436 00	...
Yuba	76,640 93	...

Bulletin No. 7 of the California State Mining Bureau, though tardy by reason of delay in the State Printing Office, contains very complete tables of the mineral products of the State for '94 in excellent form. The mineral wealth of the State, metallic and non-metallic, is well illustrated by this chart. So far as possible, every county in the State is credited with everything of a mineral character produced within its borders in '94: Alameda produced 468 tons manganese, worth $4962; 44,450 tons salt, worth $125,125; 7500 M. brick, worth $37,500; 59,642 tons macadam, $73,463; 1625 cu. ft. building stone, $1000. Like other foremost mining counties beside its yield of gold and silver, Amador added other wealth—15,280 tons coal, worth $23,020; 2500 tons pottery, worth $3000; 25,941 cu. ft. marble, worth $35,826. Besides being first in the yield by counties of gold in '94, Calaveras mined 115 tons of mineral paint or ocher, worth $2530, and 654,866 pounds copper—72 to 82 per cent—worth $64,951. Colusa, with gold mines patented to agricultural claimants by specious testimony, only returns 20 M. cu. ft. building stone, worth $7500: Contra Costa mined 35,000 tons coal, worth $94,000: El Dorado burned 10,000 barrels lime, $8000, and produced 1800 squares slate, $11,700: Fresno reports 216 tons coal, $700, and 500 tons gypsum, $4000: Humboldt, 20,000 gals. mineral water, $7200; 148,686 tons rubble rock, $199,240. Inyo shows 900 M. pounds lead, $27,000; 1,161,400 pounds borax, $81,298 (New York price); 1530 tons soda, $20,000; 12,500 cu. ft. marble, $62,500: Kern. 92 tons antimony, $3720; 6900 tons asphaltum, $138,000; 11,215 barrels petroleum, $69,334; 33,000 barrels lime, $26,500. Lake produced 12,471 flasks of quicksilver of 76½ lbs. each, worth $382,954: Los Angeles Co., beside a little gold, produced 1134 tons gypsum, $11,340; 475,650 barrels petroleum, $617,065, a product that will be more than doubled this year; 7500 M. brick, $37,500; 9500 barrels lime, $10,800; 11,000 cu. ft. building stone, $5500.

Besides its gold yield, Madera quarried 48,858 cu. ft. granite, worth $31,494; Mono mined 50,000 lbs. lead, $1500. Napa yielded the most quicksilver of any county, 9705 flasks, $298,016; 1440 tons magnesite, $10,240; 97,275 gals. mineral water, $41,231; 51 tons infusorial earth, $2040. Nevada, third on the list as a gold producer, sent out 290 tons copper paint, $5800, and 83,728 lbs. copper, $7535. Placer, which has second place in the gold counties, also produced 22,000 tons pottery, $27,500, and 65,119 cu. ft. granite, $66,700. Riverside, besides doubling its gold yield of '92, produced 7891 tons coal, about enough in quantity to supply San Fraucisco for twelve hours, worth $16,142; 1981 tons salt, $3962; 24,000 cu. ft. granite and 24,000 bbls. lime. Sacramento is credited with 11,250 M. brick and 75,000 cu. ft. granite. San Bcuito produced 1005 flasks quicksilver, $30,861; 58 tons antimony, $2280; 762 tons gypsum, $9144; 40,000 bbls. lime, $44,000. San Bernardino produced the most silver; 10,378,699 lbs. borax, $726,509; 1000 tons salt, 8000 bbls. cement, $21,600; 31,000 cu. ft. granite, 40,000 bbls. lime, 5000 tons of stone for flux and beet sugar manufacture. San Diego shows 700 tons salt, 50 tons asbestos. San Joaquin, 55 tons manganese, and a number of cu. ft. natural gas that represents a value of $75,000. San Luis Obispo produced 800 tons concentrated chrome, $10,500; 9432 tons bituminous rock, $32,263; 500 cu. ft. California onyx, worth $20,000. Santa Barbara mined 4550 tons asphaltum, worth $91,000. Santa Clara, 7235 flasks quicksilver, worth $222,169; 5009 gals. mineral water, 80,000 cu. ft. natural carbonic acid gas, 3500 bbls. petroleum, 22,725 M. brick, and 24,000 cu. ft. building stone. Santa Cruz, 20,782 tons bituminous rock, 167,000 bbls. lime. Shasta, apart from its gold, 1200 tons chrome, 200 tons iron, 150,000 gals. mineral water, $75,000. Siskiyou, 100 ounces platiuum, $600, the only county in California yielding that metal. Sonoma, 100 tons red oxide of iron paint. Ventura, 290,913 bbls. petroleum. Nearly every one of the 57 counties of the State contributed in some degree to the mineral wealth total.

Summarized, the total value of the metallic product of the State for '94 is as follows:

Metals.	*Value.*
Gold	$13,923,281 89
Silver	297,331 55
Quicksilver, 30,416 flasks	934,000 00
Chrome, 3,680 tons	39,980 00
Mineral Paint, 610 tons	14,140 00
Antimony 150 tons	6,000 00
Copper Cement, 738,594 pounds	72,486 00
Iron, 200 tons	1,500 00
Lead, 950,000 pounds	28,500 00
Manganese, 523 tons	5,512 00
Platinum, 100 ounces	800 00
Total	$15,323,331 44
Non-Metallic Substances.	
Borax, 11,540,099 pounds	$ 807,807 00
Coal, 59,887 tons	139,862 00
Magnesite, 1,410 tons	10,240 00
Mineral Water, 402,275 gallons	184,481 00
Salt, 49,131 tons	140,087 00
Asbestos, 50 tons	2,250 00
Gypsum, 2,446 tons	24,584 00
Infusorial Earth, 51 tons	2,040 00
Soda, 1,530 tons	20,000 00
Total	$ 1,331,351 00
Hydrocarbons and Gases.	
Asphaltum, 11,698 tons	$ 233,800 00
Bituminous Rock, 31,214 tons	115,193 00
Natural Gas, 80 M feet	79,072 00
Petroleum, 783,078 barrels	1,064,521 00
Total	$ 1,492,586 00
Structural Materials.	
Clays and Hydraulic Cement	$ 513,798 00
Granite, 312,365 cubic feet	228,816 00
Lime, 373,500 barrels	318,700 00
Limestone, 15,420 tons	19,275 00
Macadam, 441,867 tons	369,438 00
Paving Blocks, 2,517 M	66,981 00
Rubble Rock, 219,993 tons	295,400 00
Building Sandstone, 79,125 cubic feet	30,792 00
Concrete Sandstone, 18,000 tons	82,800 00
Marble, 38,441 cubic feet	98,326 00
Onyx (California), 500 cubic feet	20,000 00
Slate, 1,800 squares	11,700 00
Total	$ 2,056,026 00
Grand Total	$20,203,294 44

Notes on Gold Milling in California.

NUMBER II.

By E. B. PRESTON, M. E., Field Assistant State Mining Bureau.*

The guides, which direct the drop of the stems, are in two sets, upper and lower—the former above the tappets, and the latter below the cams—and are bolted to the guide girts by eight bolts. They are best made of hard wood, but pine answers sufficiently well—though the former lasts five times as long as pine. The old style guide consists of two pieces of 4-inch plank 14 inches wide, planed on all sides, and of sufficient length to fit easily between the battery posts, with equi-distant semi-circular grooves, fitting together, for the passage of the stems. A quick and exact way to make these grooves is to clamp the two planed planks tightly together as they are to be placed on the frame, set them on edge, and, after marking off the centers for five stems, bore out the circle (using the joint line for the point of center) with a long-handled auger having an adjustable bit. These are kept in many mills for this special purpose.

Before bolting the guides in place, half-inch pieces are placed between the two halves, and adjoining each stem, which are planed down later as the guides wear, leaving but little play for the stem. After boring out the grooves for the stems, and before putting the guides in place, they should be lubricated. A convenient and economical plan is to cut some semi-circular pieces of thin sheet iron of a somewhat larger diameter than the grooves, and drive them into the wood at both ends of the channel; then lay the halves level, groove side up, and fill the latter with linseed oil, letting them remain until the wood has taken up all it will absorb, when the remainder is returned to the can, and the sheet iron pieces removed.

If, in a pin guide, those portions occupied by the grooves are cut out square, and hardwood bushings fitted in before boring out, the stem will work parallel to the wood fiber, which reduces the friction, and lengthens the life of the guides; while only the hardwood bushings would need replacing, making the cost of the guides less.

The great drawback to these guides is that when a stem has to be removed the entire battery has to stop; hence the adoption of separate guides for each stem, being either all iron or wooden bushing in iron frames, which are held in place by wedges and the lips of the iron frames.

For the support of the stamp stems when suspended wooden latch fingers, or jacks, are supplied. A jackshift, three inches in diameter, rests in bearings attached to the inner sides of the battery posts; on this, cup-shaped sockets ride, in which the wooden fingers are attached, shod at the upper end with an iron plate ¼ inch thick, and provided with an iron or leather "hand-hold" near the top.

For the greater convenience of quickly removing and replacing stems, or cam shafts, large mills are supplied with overhead travelers, or "crabs," in line with the batteries, in connection with a chain block and tackle running on plates secured to the roof, shod with iron tracking. To easily reach the cams, tappets, etc., a platform is placed just below the cam shaft.

The feed floor consists of a double board floor of 1-inch lumber, with broken joints, supported on joists 18 inches apart, and about 2 feet below the feed opening in the mortar.

The grizzly is a coarse screen consisting of a number of parallel bars attached to a frame, set on an angle from 45° to 55°, over the ore bin. These bars may be of round, rectangular, or V-shaped (apex down) iron, or of wood, faced with iron, and resting on several iron cross rods, held apart with iron washers; the distance between the bars should be equal to the opening the rock crusher jaws are set to—from 2 to 3 inches. There are no fixed dimensions of length or breadth, as these depend in a measure on local conditions; but they are usually from 3 to 6 feet wide, and long enough (12 to 15 feet) to give the fine material time to drop through the spaces before reaching the crusher floor.

Where substantial steel T rails are used for tracking in the mine, they can be made to serve for grizzly bars, when no longer of use in the mine, by turning them with the base up.

The grizzly should be placed at the highest point of the mill over the ore bin, where the car or wagon can enter and dump. Its chief object is to separate at once the finely divided ore from the coarser; a secondary purpose is served in affording an opportunity to recover drills, gads, or hammers that may have come from the mine, in the ore, before they reach the rock breaker or mortar. Its lower end rests on a platform in front of the rock crusher, or, better, in a chute with an adjustable end gate placed above the mouth of the rock crusher, so as to permit of its being fed automatically.

Where the ore as delivered from the mine carries less than 5 per cent of fine stuff the grizzly should be dispensed with, especially where, in constructing the mill, fall must be economized. Some object to the use of the grizzly as tending to feed all the hard rock by itself, and say the output of those batteries is below the others.

Rock breakers or crushers are placed on a platform below the grizzly and above the ore bin in such a manner that the crushed rock mingles with the fine stuff passing between the bars of the grizzly. The rock breaker must be of sufficient weight to remain firm in its place, and strong enough to resist heavy strains; the dies should be easy to exchange and adjust, and all parts requiring to be oiled should be arranged to prevent oil coming in contact with the quartz. In large mills it is best to have one crusher to supply every twenty stamps, and on account of their intermittent work they should have driving power separate from that of the stamps.

Rock breakers are adjusted to crush the rock smaller than the throat of the mortar (therefore, less than 3 inches), but as the work of the rock breaker is cheaper than that of the stamp it would pay, with very hard rock, to do more of the crushing with this machine, even to the extent of placing two crushers, one beneath the other, and bringing the quartz greatly reduced to the stamps.

There are two general types of rock crushers. The older pattern carries a flat, fixed jaw, working with one having a reciprocating motion and using flat or corrugated dies that are reversible. The Blake is representative of this pattern. The other pattern has an outer, circular, fixed jaw, within which a corrugated jaw circles, of which the Gates is the representative. This latter machine permits of larger blocks being fed. It is an excellent machine for heavy work, and where the rock is not wet or clayey; but it requires greater horse-power, for where a Blake, 10 by 8 inches, crushing 3 tons per hour, requires 9 H. P., the Gates, with a diameter of 37½ inches, crushing 3½ tons per hour, requires 16 H. P. The Gates consists of a nearly vertical shaft of forged steel, rotated from below by a beveled wheel set ½ inch out of the center, on the top of which a chilled iron conical head is attached, with the base downward, rotating within chilled iron concaves, with an outward slope, set in the cylindrical body of the machine. Between these two faces the ore is crushed, their distance apart below being gauged by set screws. The shaft, by being made to revolve around an eccentric at the bottom, has a constant crushing power without doing any grinding. A set of concaves last two years, and can be replaced; the center shaft with the chilled iron head has been known to crush 120,000 tons of an average hard quartz before wearing out.

Ore bins should always be as spacious as the surroundings will permit, but never of less capacity than will carry a twenty-four hours' supply for the mill, say about 65 cubic feet to the stamp. They are usually constructed with a sloping bottom, to facilitate discharging, but where very large bins can be erected this feature is not so essential. These bottoms must be solidly braced and ought to be covered with iron plates over those portions where the ore has to be dropped. The front of the bin is parallel with the mortars and supplied with gates for each battery above the level of the hopper of the self-feeders. These gates should be regulated by a pinion and rack, and set for a regular discharge and delivery, through chutes, into the self-feeders. The chutes should be lined with heavy sheet iron.

Self-Feeders.—The entire value of the stamp battery hinges on a regular and even feeding, and as it can be done much better (from 15 to 20 per cent) by a machine than by hand, this latter method has become well nigh extinct in California. Among the mechanical feeders most used are the Challenge (in two patterns), Tulloch, Stanford, and Roller feeders. Although the three latter are very serviceable for certain classes of ore, and are cheaper in first cost, the Challenge is undoubtedly the best all-round machine, which is proved by its almost universal adoption. They are either placed on a frame which runs on an iron track in the feed floor, back of and at right angles to the battery, or are suspended from tracks supported by the battery posts and standards placed against the ore bin. This latter pattern permits of greater accessibility to the feed side of the mortar. In general, the Challenge feeders consist of a hopper with a movable circular plate beneath, set slightly inclined toward the mortar, receiving a rotary motion by means of gear wheels acting on the lower face of the plate, which are moved by a friction grip that receives its impetus from a blow of the descending stem on a bumper rod connected with it. Movable wings extending from the point of the hopper over the plate toward the throat of the mortar permit a given quantity of the ore to be scraped off at each blow through a partial rotation of the plate. The older machines were made with right or left-handed humpers, but the present and better plan is to place the rod in the center, so that the third stamp in a five-stamp battery imparts the blow. The newest machines have no bumper rod, but are worked by a collar fastened on the stem above the top of the mortar. Each battery is supplied with its own self-feeder.

The Tulloch feeder consists of a square frame, into which a hopper fits, having below a tray suspended from the frame at any desired angle, and in such a manner as to have a forward and backward swinging motion inside the frame, which can be arrested on the forward motion at a certain point by lugs, underneath the tray, striking a bar. The back of the hopper is supplied with an adjustable scraper, and at each motion of the tray a certain amount of the ore is scraped forward and falls into the battery. The machine is operated by the descent of the stamp.

Mortars.—The mortars in California are mostly single discharge, and cast in one piece, extremely solid. When required in places inaccessible by wagon roads they are cast in pieces, which are later bolted together. Their interior form depends on the nature of the ore, and the procedure to be applied; thus we find them made with narrow or flaring, deep or shallow troughs, and with or without inside plates. Mortars with narrow troughs are made for greater output, while a wide trough assists battery amalgamation, and gives opportunity for placing inside copper plates. In some of the newest styles of mortars a series of grooves are furnished in the lining plates, to contain quicksilver. The mortars weigh from 4000 to 6500 pounds, the bottoms being made extra heavy; in some of the latest patterns the bottoms are 8 inches thick. The length varies between 4½ and 5 feet, and the height from 4½ to 4½ feet. The inside width of the trough corresponds with that of the foot plate of the dies. A heavy flange, 4x3 inches, is cast on the base of the long sides, in which are four holes on each side for bolts, to secure the mortar to the block.

The difference in design hinges chiefly on the different opinions of leading mining men as to the method and value of amalgamating inside the battery.

The Hayward mortar is a full-lined mortar, with flaring trough, weighing, complete, about 6500 pounds, without any special arrangements for inside amalgamation.

The Alaska mortar is a full-lined mortar, with flaring trough, in which the linings are furnished with grooves, to contain quicksilver.

The Wilman mortar was the first attempt at inside amalgamation, using an inside removable copper plate, but this failed to work well; the copper plate, being so close to the shoe and die, scoured, and could not retain the amalgam. In remedying this defect the Pacific mortar was produced, in which the copper plate was placed higher up, under the feed throat; experience in the working of which suggested changes that finally evolved the Union mortar, which is provided with a copper amalgamating plate, 12x48 inches, bolted in a recess at the back of the mortar, reaching below the level of the screen opening. This plate is removed on clean-up days to be scraped, and then replaced. Similar good results have been obtained by the writer in using a double discharge mortar and filling the back discharge opening with a plank instead of a screen, to which a plate, 8 inches wide and the length of the opening, has been attached.

A modification of this back plate arrangement is noticed in a mortar designed in Milwaukee, Wis. The back plate is accessible, from the back of the mortar, through a covered opening; it is secured in place by a dovetailed key at each end, allowing it to be adjusted to the varying height of the dies.

Dies.—They consist of a cylindrical body of the same diameter as the shoe, with a square foot plate with broken corners, and should fit loosely against the front and back plates of the mortar. The broken corners permit their easy removal. They are cast both in iron and steel.

Shoes.—They are made of iron or steel, and consist of a cylindrical body of the same diameter as the stamp head, with a cone-shaped neck, half as wide as the cylindrical body, and about 5 inches long. The weight of the shoe bears a certain relation to the other parts of the stamp, generally about one-sixth of the total weight when made of chrome steel, but somewhat less when made of iron. The cylindrical portion of the shoe is somewhat longer than the corresponding part of the die, on account of its greater wear—the latter being protected by a cushion of quartz. Both shoe and die are used until worn as thin as possible; with the shoe this may be ½ inch, though rarely, while the die is worn to the foot plate, if not fractured previously. This practice is not to be commended, and should only occur in case of necessity. On stamps weighing about 900 pounds the shoes, if of chrome steel, weigh about 150 pounds, and if of iron weigh about 20 pounds less, and are about 9 inches in diameter. The life of the shoes depends on the nature of the quartz and the height and speed of the drop, but as a general rule shoes and dies of steel last as long as two and a half sets of iron ones, and cost twice as much. In the matter of choice between steel and iron, the proximity of the mill to foundries is of consequence. Steel shoes and good iron dies usually work very smooth, but where the waste iron can be disposed of at a foundry this metal is preferred for both.

(*To be Continued.*)

*Bulletin No. 6, California State Mining Bureau.

Reasonable Geology.

NUMBER V.

By FREDERICK DANVERS POWER, F. G. S.*

When a few things resemble each other in many properties, so that we are led to believe what we know of one is true of another, it is a case of analogy. Reasoning by analogy is always an uncertain guide, and we can never be sure that we are arguing safely; all we can say is, that when two cases are similar in many respects, it is probable they will resemble each other in other points; and that the more points of similarity there are between them, the more likely we are to be right. There are many minerals almost peculiar to certain localities, so that by their characteristics one can at first sight name the place where they were found, such as the celebrated iron glance crystals from the Island of Elba, the piuk fluorspar of St. Gothard, and the pink apophylite from St. Andreasberg, etc. There is, so far as we know, no reason why similar specimens should not be found elsewhere; still it remains a fact that by studying rocks and minerals one can frequently name the birthplace of a specimeu. The early gold buyers of Australia could almost invariably name the locality of a parcel of gold, even if it were attempted to mislead them by a false statement.

A man in one locality may become thoroughly conversant with the lodes of his district, aud able to form a correct judgment about them, though he might find it difficult to put his reasons and arguments into words; he may even have gone so far as to determine the cause of the deposit. If placed in another country and told to search for similar lodes with which he is acquainted, he would naturally reason from what he had learned in his little corner of the earth, and if he found the productive veins to run east and west, and the barren ones to course north and south, he would be apt to pay attention to the former and ignore the latter, although circumstances might be so altered in the new place that the position of the productive veins were reversed.

The antecedents of a deposit in one instance are not always necessary for its production in another, and certain indications—*e. g.*, the presence of particular minerals, which are considered as favorable in the one case, might be just the opposite in the other. We must use provisional generalization, for as Herbert Spencer says—"If we waited till all the facts were accumulated before tryiug to formulate them, the vast unorganized mass would be unmanageable." At the samc time, we must guard against the abuse of generalization. To frame an hypothesis that cannot be verified, or to neglect its verification, leads to no result or to a fallacy, and this is why so many persons have such a strong antipathy to what they call "theory." An hypothesis must have at least two different facts; it may, however, agree with several observed facts, and still be wrong. Before deciding to accept it as true, we should test it in every conceivable way, and when possible verify it with our senses. It was owing to au hypothesis agreeing with certain observed facts and traditions that made our forefathers believe Noah's flood to be universal. From all countries we hear of extensive floods, and we find fossil remains of sea shells even on the tops of mountains. What more do we want? On more thorough examination the dates of the floods are found to be vague, or not to tally, and even at the present day we have extensive floods in all quarters of the globe. Then, again, the fossils are found to belong to various formations of different periods, and if we push the subject still further we discover that there is not enough water in connection with our globe to cover our hills, and if there were, the rapid subsidence of such a body of water is inconceivable.

When an hypothesis agrees in several of its results, and when by its help we are enabled to predict certain things, such as we would not otherwise have discovered or expected, theu we may he almost sure that the hypothesis is correct. It was in this way that certain of our elemeuts were predicted and discovered by thoughtful men who noticed blanks in the tahles constructed from the periodic law. J. A. R. Wewlands predicted the discovery of Germanium. Mendelejeff predicted Gallium, also Scandium; the latter, which he named Ekaboron, was discovered to exist by Nilson in 1879. Uneducated miners often ask what good theory is to a geologist, and state that we seldom hear of a geologist discovering a valuable deposit, and that for every one a geologist finds the so-called practical miner—in other words, the pick-aud-shovel man—finds a score. No doubt this is true, and he might add that out of the score, nineteen were discovered by accident, and in many cases by persons—not always men—who had never done any mining before, or given the matter a thought. I have before me several examples of mines which originated in the unthinking action of a child, horse, duck, wombat, etc., and also of cases where the practical miner has looked away from valuable minerals, and passed on by the other side.

*London Mining Journal.

When we consider the small percentage of geologists in the world compared with that of miners, and further take into account that very few of these devote their time to prospecting, it is no longer wonderful that we hear so little of finds by geologists. Many geologists are only sent to the field after a discovery has been made, and as soou as their inspection is over they have to leave to carry out other work without an opportunity of endeavoring to find new deposits. Mr. S. F. Emmons made a thorough investigation of the Leadville district, Colorado, for his monograph on those deposits. As a result, he tendered certain advice to the miners; those who took it profited by it, hut those who refused and thought they knew better, found out their mistake to their cost.

Many predictions have been made as to the presence of certain minerals in different localities which have been subsequentiy verified. R. J. Murchison (Q. J. G. S., Vol. VIII, page 134, and "Siluria," third edition, page 489) prophesied the occurrence of gold in Australia; he made a slip, however, when, relying on the knowledge of auriferous deposits gained in the Urals, he said that we need not expect gold below a certaiu defined limit. Geologists often have this thrown in their faces; but those who always like to look on the worst side of things forget that Murchison was always ready to acknowledge his mistake, and corrected it in subsequent writings. Professor T. W. E. David, of Sydney, foretold the presence of coal under that city; last year the 10 foot seam was struck by a bore at 2929 feet—*i. e.*, within 30 feet of the depth David had calculated, which we must consider very good, as there was nothing to guide him nearer than 20 miles away. (*Engineering and Mining Journal*, Vol. LVI, page 630.) In 1816 Mr. N. J. Winch forecast the occurrence of salt in the Tees valley, and it was discovered there in 1859. (T. G. S., Vol. V, page 543.) Captain Nichols found iron deposits in the Mesaba helt, Minnesota, in 1890, which had been predicted by the State Geologist and his assistants in 1888. (The Mesaba Iron Range, T. A. I. M. E., 1892.) Many similar instances are known to geologists which I need not repeat here.

Reason declares that which is hid from ordinary observation, or, as Dr. Robert Ball puts it—"When observation fails, our reason steps in and adds greatly to our information." Surely it is more manly to try and find out the causes of phenomena we see around us than to be satisfied with substituting a synonym for a reason, or evade the investigation by assuming a cause we do not understand, concluding that there must be some connection between two things we are almost ignorant of. Any one who descends to such deceptive reasoning, which, if he thinks, he must know is wrong, can have but little faith in himself or his conclusions, and had better join the ranks of those who believe in the obvious fallacy that if a little knowledge is a dangerous thing, a great deal of knowledge is still more so.

'Twould Be a Foot Higher.

Two men were sitting in front of the store discussing the financial situation. One was an out-and-out free silver man and the other a monometallist.

The silver man was demanding free and unlimited coinage, while the gold man insisted that all this silver talk would amount to nothing.

A third man drew up a chair, and, after listening quietly for a while, spoke up, saying, "Maybe you're right 'bout all this silver talk 'mounting to nothing, but I'm a silver man and I'm of the opinion it's going to tell. It's just like this:"

The two disputants settled themselves comfortably, and the third man continued:

"There was a certain farmer in the Kansas cyclone district who was building a stone wall. He was putting it there to stay, building it five feet 'cross the base and four feet high. A stranger came riding by aud seeing the care the farmer was taking, said to him, "You seem to be mighty careful about that wall."

"'Yep,' replied the farmer, 'I'm er building her to stay.'

"'T'aint no use,' replied the stranger; it'll blow over just the same.'

"'Wall, let her blow over, she'll be a foot higher if she does,' replied the farmer, continuing his work."

The gold man lighted his pipe.

THE United States census of 1890 shows a total male population of voting age of 16,940,311, of which persons of foreign birth number 4,348,459, and those of native birth 12,591,852. The aggregate white population of voting age is given at 15,199,856, 10,957,496 native born and 4,242,360 foreign born. Of the uative male voting population 8,807,223 are the sons of native parents, while 2,150,273 are born of foreign parents. The total colored population of voting age was 1,740,455. The voting population of the eight largest cities is as follows:

	Total Voters.	*Native.*	*Foreign.*
New York	446,798	177,729	269,069
Chicago	331,593	133,109	198,484
Philadelphia	307,274	191,785	115,489
Brooklyn	225,607	112,666	112,941
St. Louis	130,056	73,450	56,606
Boston	137,910	74,179	63,731
Baltimore	116,658	86,797	29,861
San Francisco	116,350	41,146	75,204

Comments of a Prospector.

TO THE EDITOR:—At the recent California Miners' Convention, under the spell of environments, and inspired by the magnetism of the men from the mountains, Mr. Hugh Craig, president of the Chamber of Commerce, and in the name of the merchauts of Sau Francisco, welcomed the Miners' Convention, and admits that "our State and our city owes a vast debt of gratitude to the miner." Boldly he asserts: "Gentlemen, we are with you in this mining business;" he even invites the miners, "when you come to the city with a good mine, just let us in on it; that's all we ask."

What a happy change of condition and views must have taken place, or occurred, these last few weeks! The miners are glad to notice this return of confidence on the part of San Francisco merchants (how about bankers and others?); they are delighted, and somewhat astonished, too, to be asked by San Franciscans "to be let in" when the miners can offer a fair show of some taugible evidence of a profitable mine, quite willing to divide with their San Francisco comrades the wealth to be brought to the light of day by their joint efforts.

So far, so good. But what is, or, let us now say, what has been, the experience of a prospector coming to this city, during these long years, with an offer of a favorable prospect, with some specimen and hope of assistance to open a ledge, or at least to determine by some work its value and extent? If unknown, they were not even listened to; if known and with good reputation, they were listened to by courtesy, and then politely informed of the inability (a suitable word for indisposition) to do anything whatever in that line. And this, mark you, not merely with merchants, professionals or those engaged in industrial pursuits, aye, even with mining men and those who gained their competency, if not wealth, through mining operations or mining deals. Another thing to mark is this: Not mere prospects, or surface scratchings, or outcroppings, with a few holes here and there, were offered and refused; no—ledges where shafts 100 feet deep, or tunnels and corresponding drifts have been run; where the surface ore of the pay shoot had paid, sometimes, extraordinary expenses; where there was wood, water power, sometimes ditches and flumes already at hand; where unforseen or extraordinary circumstances had prevented a continuance of operations; where the incompetency or negligence of the owners, or the insufficiency of adequate meaus and appliances, resulted in loss of gold when the rock was milled. Were such not sufficient inducements and reasons, at least to those who "ask to be just let in on it," to secure their active and practical cooperation? Thus far it had not been the case.

But the voice of the merchants was heard, and their words are recorded; and let us hope that the Half Million Club will perceive that, with a languishing mining industry, an over-hurdened agriculture, and a too often unprofitable horticulture, their efforts would be in vain, and that San Francisco, with all her advantages, could not attain for a long time that eminence to which she seems to be destined. Actual deeds must be equal to good intentions and friendly professions of all those who can see in the united pull of miners, farmers, industrials and merchants, together, the dawn of another era of prosperity for city and State, which, under proper conditions and guidance, are manifestly destined to become stars of the first magnitude.

PROSPECTOR.

Aluminum Bronze.

Aluminum and copper form two series of valuable alloys—aluminum bronze, containing from two to twelve per cent of aluminum, and copper-hardened aluminum, containing from two to fifteen per cent of copper. The five to twelve per cent alumiuum bronzes are among the densest, fiuest-grained and strongest alloys known—alloys having remarkable ductility as compared with tensile streugth. The alloy of between ten and eleven per cent of aluminum with copper is the "true aluminum bronze," and is the way the alloy should be first made, the lower bronzes being made by dilution of teu per cent bronze with more copper. The teu per cent bronze can be made in forged bars with 100,000 pounds per square inch tensile strength, with 60,000 pounds elastic limit per square inch, and with at least ten per cent elongation in eight inches; and aluminum bronzes can he made to fill a specification of even 130,000 pounds per square inch and five per cent elongation in eight inches. Such bronzes have a specific gravity of about 7.50 and are of a light yellow color. The five to seven and a half per ceut aluminum bronzes of from 8.30 to 8 specific gravity, and a handsome yellow color, readily give 70,000 to 80,000 pounds per square iuch tensile strength, with over thirty per cent elongation in eight inches, and with an elastic limit of over 40,000 pounds per square inch. It will probably be alloys of the latter character.

istics that will be most used, especially in bronze wire and for marine work, and the fact that five to seven per cent bronzes can be rolled or hammered at a red heat, proper precautions, which can readily be secured, being taken, will add greatly to their use.

Alloys of this character can be worked in almost every way that steel can, having for its advantages its greater combined strength and ductility and its greater power to withstand corrosion. The presence of silicon makes a harder bronze, but one of much less comparative ductility and a less malleable alloy. The presence of iron weakens and very seriously interferes with the value of the bronze. The presence of zinc in the aluminum bronze is not deleterious—in fact, it makes the best aluminum brasses.

Aluminum in bronzes lowers the melting point of the copper at least 100° or 200°. The melting point of ten per cent aluminum bronze is somewhere in the neighborhood of 1700° Fahr. Aluminum bronze is among the hardest of the bronzes and hardens upon cold working considerably. This hardness, however, can be lowered by annealing at a red heat and plunging into cold water. Aluminum bronze can readily be worked in a lathe and the chips cut smooth and long and do not clog the tool. Aluminum bronze is a remarkably rigid metal under transverse strain, being much more rigid than ordinary brass or even gun bronze; and under compression strain, although rather low in elastic limit compared with its ultimate compressive strength, it is still much stronger than any of the other bronzes, and there is a long period of gradual compression before finally giving way, making it a peculiarly safe metal under compression. Aluminum bronze has special anti-friction qualities, owing to its fine grain texture and peculiarly smooth and unctuous though hard surface, which resists abrasion remarkably.

Sound castings can be made with aluminum bronze if the precautions are taken to avoid the difficulties which are particularly imminent in melting.

1st. Care must be taken not to overheat the metal, for if the metal is heated to too high a temperature, the aluminum will oxidize, the aluminum oxide which is formed making the entire casting "dirty." The metal will also be spongy from the presence of large amounts of occluded gases.

2d. The scum which floats on top of the melted bronze in the crucible must be prevented from going into the body of the casting. This is accomplished by providing the casting with suitable skim gates.

3d. The greatest trouble in making bronze castings, however, arises from the shrinkage of the metal, which is very excessive; but the difficulty can be overcome if the casting is given a large sinking head and "risers." It is necessary to make the sinking-head fully as large as the casting in many cases.—Aluminum World.

Concentrates.

THE Zeila and Argonaut companies of Jackson, Cal., paid out $20,000 for labor and supplies in October.

OVER 2,000,000 shares stock were sold in the Colorado Springs mining exchange on the 12th inst.

QUICKSILVER from the Savona mines has been placed on the market, says the Kamloops, B. C., *Sentinel*.

NEARLY $50,000,000 gold has been produced from the Cariboo, B. C., district since its first discovery in '59.

NEW YORK MEN are reported buying seats in the Colorado Springs Mining Exchange, paying $1000 therefor.

BEN WILSON is reported to have sold his placer ground in Boise basin, Idaho, to a London company for $300,000.

THE Homestake Mining Co. will pay its monthly dividend of 25 cents per share, amounting to $31,250, on the 25th.

AT Keswick, Shasta Co., the Iron Mountain people are reported contracting to work custom ore from that vicinity.

SUPT. MORCUM proposes to put in a complete electric light plant at the Grande Ronde placer mines, La Grande, Or.

THE Merrimac mine, between Grass Valley and Nevada City, is reported sold to Colonel Stone of this city for $20,000.

CAPT. DE LAMAR has bought the Mercur, Utah, property on a $1,500,000 basis, and will take possession January 1st, '96.

AT Bodie in October 271 miners were employed. The *Miner* says $4000 assessment work is to be done on claims in that vicinity.

COLORADO AND UTAH smelters will advance charges from $1 to $3 per ton on January 1st, '96. The advance will affect only silicious ores.

THE Gold Note mine at Kennedy, Nev., is now reported paying well. The ore is sent to the Selby smelting works, and averages $150 a ton.

VAGUELY the New York *Tribune* says: "The golden age of the Sierras has not yet passed away." No, it has not; in fact, it is just beginning.

PUEBLO, COLORADO, announces that it will no longer play second fiddle to Denver or Colorado Springs, but will have a mining exchange of its own.

THE annual report of the Con. Cal. & Va. Mining Co., published on page 342, shows that the Comstock is by no means extinct as a producer of silver bullion.

THE Edna mine, near San Andreas, Cal., is reported sold to Mackay & Flood. The shaft is to be sunk to a depth of 1500 feet, crosscutting to begin at the 800-foot level.

"TO DECIDE A BET," this column is asked to state whether South Africa or California "was ahead in the gold yield in '94." South Africa produced the larger number of ounces of gold in '94. This country's gold yield for '94 exceeded in value that of South Africa. The question is not precise, but these facts may aid in determining the wager.

A RUSH is reported to locate mining claims in a newly discovered section on Mt. Bill Williams, near Williams, Arizona. Old local prospectors are not among the rushers.

SOME scary stories were afloat in the early part of the week regarding the burning of the flume of the Utica mine by prevalent forest fires. According to latest advices, the fire is under control.

THE Holcomb Valley Mine and Mill Co., in San Bernardino county, has suspended operations. The company recently failed to secure a patent on their land, which was awarded to the Southern Pacific Co.

THE mill at the English Mountain mine, Graniteville, Nevada Co., will be shut down December 15th. Supt. Howard has gone to New York; he will return in the spring, when operations will be resumed.

THE Petticoat mine, Railroad Flat, Calaveras Co., is reported sold to E. C. Loftus of Sonora, who recently purchased the Keystone mine at the same place and erected a hoist and mill of three 3-stamp batteries.

FOREST FIRES last Thursday destroyed the hoisting works of the Tin Cup mine, three miles east of Placerville, El Dorado Co. The shaft also was destroyed. It was the property of W. H. Martin of the Rawhide mine.

IF England insists on the permanent establishment of the Alaskan boundary line as mapped out by the Canadian civil engineers, the city of Juneau and Douglas island, where some of the richest gold mines are located, will become British territory.

A NOT UNUSUAL FEATURE in the recent rich find in the Gray Eagle drift mine, Placer Co., is that the drift extends beyond the line of the mine into lands recently taken up by a man named Clark as agricultural and then bonded to the mining company at $60 an acre.

A JOHANNESBURG CORRESPONDENT says there is a splendid opportunity for some one to start a good American hotel there; that big money could be made catering to a class of well-paid mining men, who would be willing to pay well for superior accommodations.

COLORADO figures that in '93 there were employed in mines, mills and smelters in that State 22,951 men, and now 26,379, a gain of nearly 15 per cent. The big increase is, of course, in Cripple Creek and other gold districts; the decrease in the Aspen and other silver districts.

STOCKHOLDERS of the Owens Consolidated Mining Co. want to change the principal place of business from San Diego to Oakland. W. B. King of Oakland represents 89,970 shares. The mine is near Julian, San Diego county, has produced $500,000 in gold, and operations are to be resumed.

ARCHULETA Co., southern Colorado, sends the biggest gold story of the month. A gold vein is reported "1000 feet across," averaging $8 a ton, and the man who figures so many feet each way, so many tons and so much to the ton has already illustrated the facility with which all the debts of the different nations can now be paid.

RESIDENTS at Stone Station, Montana, complain that at the time the Montana mineral land commission was making the classification large tracts of mineral land had been selected as agricultural; that the thing had been carried so far as to include placer ground that had been worked for a decade, and was actually being operated upon when the commission was at work.

A. D. WHITTIER, agent and manager for the Cariboo Gold Fields Company, says that next season a standard gauge railway will be begun, running from Kamloops on the Canadian Pacific to Bakerville, in the heart of the Cariboo gold district, 350 miles farther north. The road is estimated to cost about $22,000 a mile, or $7,700,000, and eventually is expected to reach the gold fields of Alaska.

A PHŒNIX, Arizona, paper says entire districts thereabouts are literally tied up by a few men who own all the way from 20 to 100 claims each which they cannot or will not work and will not allow any one else to. For miles and miles, no matter which way the prospector turns, he finds the ground located. Such a course is financially suicidal, not only for the individual who adopts it, but for the entire country.

THE Venturina Mining and Milling Company has incorporated at San Diego, Cal., to transact a general business in mining for precious metals and for oil or gas, deal in water, water rights, electric plants, smelters; capital stock, $100,000; amount subscribed, $51,100, by the following five directors: J. G. Witherby, $17,000; N. R. Titus, $17,000; J. W. Brenning, $17,000; J. A. Flint and O. C. Smith, $50 each.

IN Cripple Creek district, Colorado, it is estimated there are 4300 men employed in the mines, which means a pay roll of over $200,000 a month. Before the panic in 1893 there were only 525 men employed in the camp. The Portland is working the greatest number, the pay roll showing about 200; the Victor has 130 men employed, Isabella 70, Strong 68, Independence 50, Elkton and Moose 70 each, Union 65, Last Dollar 75, Anaconda 60, Anchoria-Deland 50, C. O. D. 45, and the Doctor 30.

IN Montana the penalty for attempting burglary at night is seven years in the penitentiary, while an attempt to commit the same offense during the day is only a year in the county jail. According to law, also, the day is between sunrise and sunset. A man was tried recently in Butte for attempted burglary in the night, but his attorney established the fact that the crime was committed at 5:10 in the morning of August 5. The almanac showed that the sun rose at 4:56 A. M. on that day, and this enabled the accused to get off with nine months in jail.

SOUTH AFRICA takes precedence in the magnitude of its mining fights as well as in other things. A dispatch from Johannesburg, dated the 8th, says a serious tribal fight had taken place in the Rand between employes of the Jumpers mine and those of the Geldenhuis and Treasury mines. Fully 2500 Zulus and Shangans took part in it, pickaxes, rock drills, stones and other weapons being used. After a furious hand-to-hand encounter, in which at least four natives were killed, the Jumpers were driven back into their compound, which the victorious Geldenhuis looted. A large number were wounded. Time was when in Pioche, Nev., a battle between half a dozen rival workers in the Raymond & Ely and Hermes would be considered worthy of extended newspaper notice. "Fully 2500 Zulus and Shangans" are capable of making a very lively scrimmage.

IT is conservatively estimated there are now about 600 men employed in the mines at Wardner, Idaho, at $2.50 and $3 a day, making a monthly payroll of between $55,000 and $60,000. The Bunker Hill and Sullivan employs over 400, the Last Chance, of which Charles Sweeney is superintendent, between 90 and 100, the Stemwinder and the Sierra Nevada each has a small force, the two latter properties being under lease, while other leased properties are also working a few men. The Last Chance concentrator is working steadily. It is reported that the force on the Last Chance is to be increased to 200 men.

AMONG Colorado dividend-paying mining stocks Argentum Juniata has paid in all $156,000; the last dividend paid was on October 15th, three cents. Bangkok-Cora Bell last dividend, one-half cent, October 5th; amount paid to that date $98,000. Elkton has paid out nine 1-cent dividends, a total of $45,000; the last one was December 15, '94. To date the Mollie Gibson has paid out in dividends $4,080,000; last dividend five cents, January 25, '95. Portland has paid $442,500; last dividend paid October 15th, two cents. Union has paid $37,000, the last one being one cent per share on May 25, '95. Pharmacist has paid out $80,000, the last dividend being paid January 15, '93. Moose has paid about $132,000; a one-cent dividend is paid every month. Union Leasing has paid $320,000 of four cents per share; last dividend July 20, '95. Victor has paid out $415,000 in dividends and a $20,000 premium is now distributed every month.

THE Carson mint disclosures, which have furnished entertainment to Nevadans for '95, still have front place. One Heney is now on trial for alleged theft of bullion. This week Thos. Price of this city, an expert witness, testified that in working gold by the chlorination process it would, if imperfectly worked, be held in solution and run off in the mint sewer. Several witnesses who had taken samples of mud from the mint sewer, which had been assayed, gave testimony. The samples ran from 25 cents to $52 a ton. The sewer had its outlet in a potato field. About forty samples of the earth therefrom were placed in evidence, with their assays, showing an average of $11 to the ton. The value of the muck in the sewer was estimated at $2000. The defense showed that a stretch of ground reaching from that potato field to the State prison, nearly two miles distant, had been turned into fine-paying placer diggings by the gold and silver which floated out from the sewer of the mint.

LAST January R. Cain was arrested at Redding, charged with the theft of two bars of gold bullion from the Gladstone Mining Co. He was tried and acquitted. At his trial he claimed that he had received the bars from G. V. Gray, superintendent of the mine, in payment for money loaned. Before the trial Gray had sailed for Mazatlan, Mexico, on the Colima. Neither side had subpœnaed him as a witness at the trial, and it was said he had fled the State. He recently returned from Rosario, Sinaloa, Mexico, where he is superintendent of the Estrella and Sierra Leon mines, 110 miles from Mazatlan. Hearing of the charges made against him by Cain, he voluntarily went to Redding at his own expense, and gave his deposition before a notary in an action of the Gladstone Mining Co. to recover the gold bar found on Cain, and is stated by C. W. Taylor, the company's attorney, to have completely refuted and contradicted every assertion of Cain's which charged him with any wrong doing.

THE case of Simpkins vs. Savage, lately decided by the circuit court for Josephine county, Or., determines an important local question, viz., rights to mine the beds and bars of Rogue river and its tributaries, the Applegate and Illinois. It is well known that these streams are rich in gold, and when the sandbars therein are exposed by low water it becomes very profitable to work them. The decision of the circuit court determines the title to these sandbars. The court held that in such streams as Rogue river the riparian owner takes to the thread of the river, subject to an easement in the public to use the stream for navigation. Meander lines described in the surveyor's notes or in the patent do not necessarily determine the boundary of the tract. They are run for the purpose of defining the sinuosities of the banks of the stream. The water is the real boundary. A grant from the Government, without reservation, of lands on the banks of a navigable stream passes title to the unsurveyed islands lying between the mainland and the center of the stream.

DR. GAZE of New Zealand has a patent there for the use of chloride of bromine as a solvent for gold, the use of caustic soda to recover the chlorine and bromine for use, and the recovery of the gold from the solution by electrolysis instead of by chemical precipitants. The most important part of his claim is the method adopted for making the solvent used in gold extracting. He proposes using a containing vessel of about three feet in diameter and two feet deep. A number of porous cells filled with plain water are placed in this vessel, each porous cell having a number of carbon rods placed in it. The containing vessel itself is filled with a strong solution of chloride and bromine of sodium, and more carbon rods are immersed in the solution. The whole is fitted with a lid, one set of carbons being connected with one pole of a powerful dynamo machine, and the other set with the other pole. On passing a strong current of electricity through the electrodes the salts are separated, the chlorine and bromine uniting, and the chloride of bromine thus formed is forced into a vessel overhead.

AT last Mouday's meeting of the U. S. Debris Commission permits were given to the following hydraulic mines: Bobbie Burns mine, near Placerville, El Dorado county; Tiedeman mine, near Georgetown, El Dorado county; Blacklock mine, near Placerville, El Dorado county; Good Hope Mining Co., in the Richmond Hill mine, near La Porte, Plumas county; King Sayre mine, near Port Wine, Sierra county; Canada mine, near Port Wine, Sierra county; Pacific mine, near St. Louis, Sierra county; Ferrel mine, owned by the Eureka Lake and Yuba Canal Co., near Columbia Hill, Nevada county; Fred Lewis mine, near Spanish Ranch, Plumas county; Dutch mine, near La Porte, Sierra county; Sailor Creek mine, near Garden Valley, El Dorado county. Permits to construct impounding dams were granted for the following mines: Martin mine, near Placerville, El Dorado county; Plumas Blue Gravel mine, near Nelson Point, Plumas county; Chaparral Hill mine, near Onion Valley, Plumas county; Arctic mine, near Butte Valley, Plumas county; Michigan Hill mine, near Quincy, Plumas county; Jackson Creek mine, near Cromberg, Plumas county; Miocene mine, near Crescent Mills, Plumas county.

Scientific Progress.

A Cure for Burns.

A discovery of the greatest use to miners, ironworkers and enginemen has been made by Dr. Thierry of the Hospice de la Charite, Paris, who found, quite accidentally, that superficial burns may be cured almost instantaneously by a solution of picric acid. When a medical student, chiefly engaged in surgical operations, he used picric acid as an antiseptic, and consequently had his hands constantly impregnated with this solution. One day in lighting a cigarette he allowed some ignited phosphorus to fall on his hand, and felt no pain as might have been expected; and on another occasion, while sealing a letter, the melted wax fell on his hand, leaving a slight trace of burning but causing no pain. During the last two years, at several hospitals in Paris, he had treated burns with a saturated solution of picric acid and obtained convincing results, all pain being suppressed instantly after bathing the injury in a solution of this acid, which is perfectly harmless. No wounds were formed, not even blisters, and a complete cure was obtained in four or five days. Dr. Thierry advocates the practical application of this discovery in mines and works where burns are so frequent; and as picric acid is efficacious in proportion to the speed with which it is applied after the accident, he counsels the having ready a supply of solution. He observes that the fifty of this acid composition, the facility with which it is preserved in saturated solutions for which there is no occasion for any weighing, and the cheapness of the product, permit of keeping ready in a small volume a sufficient quantity to make gallons of solution. "If, for instance," he adds, "a firedamp explosion should cover the miner with burns—as happens too frequently—and he be plunged into a barrel of picric acid solution, he will be saved from great suffering, often followed by death.

Measuring Starlight.

An English astronomer named Minchin has invented an instrument which accurately measures the quantity of light given out by a star. Stars are designated as being of the first down to the twentieth magnitude, according to the intensity of the light given out. The magnitude of a star has hitherto been judged by the eye, and anything like exactitude could not be obtained. By the new invention the rough designation of magnitude is represented by numbers which give the exact ratio of one star to another in the light-giving powers. The star Arcturus, for example, is estimated by the new process to give seventy-five and three-quarter times the light of Regulus.

This instrument will he of great use not only in astronomy but in meteorology also. The amount of light which reaches the earth from the stars varies according to the state of the atmosphere, and the inventor claims that forecasts of weather can be obtained in this way which will be far more accurate than those obtained at present.

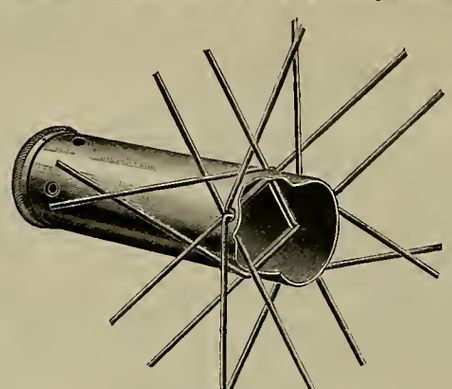
According to *Industries and Iron*, the Mills' steel process consists of preparing pure metallic iron in a state of atomic division, mixing with this iron whatever proportion of carbon may he desired, and then fusing the mixture in a crucible. The steel so prepared is represented to be entirely free from occluded oxides of carbon, whilst the castings are remarkably sound. The process depends upon the fact that if ferric oxide or ferrosoferric oxide is heated with finely divided iron out of contact with air and cooled uuder similar conditions, ferrous oxide is produced. The operation takes place at a visible red heat, about 450 C.; but ferrous oxide is reduced to metallic iron at ahout 350 C. The hest reducing agent is carhonic oxide. This may be prepared in any of the water gas machines, using carbonic acid instead of steam. Carbonic acid is produced by the action of carbonic oxide on ferrous oxide; reduction of this oxide is effected in a slowly revolving iron cylinder. At many gas works an oxide is produced which is singularly well adapted to the process; the oxide obtainable at the Sheffield Gas Works yields, on an average, 60 per cent of pure iron, the residue consisting almost entirely of alumina. Such an oxide, after reduction to metal, is more cheaply and efficiently purified by magnetic separation than by the method usually employed. Gold and silver in remunerative quantities are almost iuvariably present in the dust rejected by the separator.

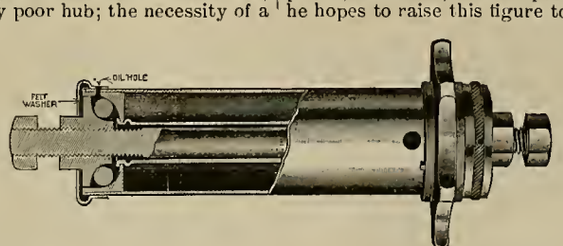
The Keely motor appears to have taken auother start. It is now stated that John Jacob Astor will invest largely in "the new force," and an electrician is quoted as saying that there is no use in devoting any more time to the development of electricity. The *American Manufacturer* is told that a box 8x18 inches in dimensions, placed on the end of a street car, will, without gearing or wire connection with the wheels, generate sufficient energy to run the car. The public, according to the latest statement, is to he given full particulars by the close of the year.

Mechanical Progress.

A New Tubular Hub.

Heretofore the weakest part of a bicycle's anatomy has been the construction of the huh. the imperfections of which have been an endless annoyance to both rider and manufacturer. A few of the complaints that have made their lives miserahle are: Breaking and chipping off the heads of spokes, indirect, and consequently imperfect oiling; accumulation of dust in the bearings; the necessity for at least thirty perforations, corresponding to the number of spokes in the hub, each perforation weakening the comparatively small huh or flange, thereby making of this important part an excellent collender, hut a very poor hub; the necessity of a





double thread for fastening the rear sprocket, and consequent possibility of loosening on the road. The new Bolte tuhular hub, manufactured hy the Bolte Cycle Mfg. Co., Milwaukee, Wis., does away with many of these objections. The 32-spoke Bolte wheel is constructed by passing four double spokes through each of the four holes at either end of the tubular huh. The accompanying cuts will show that in avoiding hooked spokes bent at sharp angles, the old trouble of tearing the holes hy high tension, as well as the danger of total displacements by a sudden jar, would be entirely avoided. This unique hub makes the rear sprocket absolutely secure. No more rear sprockets to look after; they take care of themselves.

Maxim's Flying Machine.

The machine is purposely designed of extreme size with the intention of thoroughly testing and elaboratiug the details of mechanism and of measuring the lifting power within immediate reach of a workshop and skilled mechanics, more than of actually taking to the air. This will probably be first attempted with a smaller machine, capable of lifting one man, of jockey-like proportion and mounted on a boat on a lake, so that short flights, like those of a flying fish, can be attempted for initial practice.

The lifting force of the machine is measured automatically as it runs along a railway track about one-half mile in length, and the machine is prevented from taking to flight by wheels running underneath outer wooden rails. Much yet remains to be done in the way of practice in vertical steering before taking leave of the earth, the chief difficulties of the aviator beginning when he wishes to desceud and alight on the ground again.

The machine, complete, with water, uaphtha fuel and crew of three men on board, weighs 8000 pounds. With a pressure of 275 pounds of steam per square inch, the engines develop 360 H. P. The thrust of the screws is 12,000 pounds and the lifting effect of the aeroplanes and wings (4000 square feet area) is 10,000 pounds. A thrust of 2000 pounds at 45 miles an hour gives 240-thrust horse power, or, with a speed of advance of the screw of 60 miles an hour, 230 indicated horse power.

The total projected disk area of the screws is 500 square feet, each screw being nearly eighteen feet in diameter, with a pitch of sixteen feet, thus requiring 330 revolutions a minute to give a speed of advance of 60 miles an hour.

Mr. Maxim calculates that, after making all allowances, he can at present lift twenty-eight pounds per horse power, but that, with improvements, he hopes to raise this figure to fifty or sixty pounds and then a machine could take a flight of 500 or 600 miles.

When the machine is perfected, Mr. Maxim claims that the railway may bc dispensed with and that a short run over a moderately level field will enable it to attaiu velocity necessary to rise. As far as landing is concerned, he says that the aerial navigator will touch the ground while moving forward, and the machine will he brought to rest by sliding on the grouud for a short distance. In this manner very little shock should result, whereas if the machine is stopped in the air and allowed to fall directly to the earth without advancing, the shock, though not strong enough to be dangerous (?) to life or limb, might be sufficient to disarrange or injure the machinery.

Of course this implies a tract of land of sufficient size and having surface of a proper character to permit a safe landing. If the machine be employed for regular traffic, as river steamboats are, such landings could be provided. But it has generally been supposed that Mr. Maxim's aim was to produce a machine applicable to military service, and landings of the kind considered are not portable. From a military point of view, the lives of the crew might uot be important after enough skilled navigators of flying machines have been trained to the art; but the crippling of the machine might be attended with serious derangement of plans and other bad consequences, not to mention the item of cost, which would not be trifling. The problem of artificial flight cannot be considered as fully solved till machines are constructed that can come down easily and safely upon any handy bit of level ground, as pigeons alight upon wheat fields.

The aeroplanes and wings are mounted on a slope of ahout one in eight. These surfaces are formed of canvas, stretched on a skeleton framework of hollow steel rods for the struts and thin steel for the ties. The large central aeroplane is composed of two parallel canvas surfaces, with a space between, and in this way the shape is preserved better, and the general set of the wings, smooth, like cardboard, should excite the envy and stimulate the imitation of our sail-makers for yacht racing. The front aud rear wings are pivoted ahout a horizontal axis so as to act as rudders in a vertical plane.

The machine is started from a position in which it has been retained by beiug tied to an indicator post; the propellers are then set in motion and soon drive gales of wind in their wake. When the pull of the rope has reached a definite amount—say 2000 pounds—a hook is released, and the machine starts on its voyage along the track.—Nature.

Commercial Aluminum.

Aluminum is very ductile, and has frequently been subjected to the most severe tests with most satisfactory results, and is equal in all respects to the metal manufactured hy the sodium process. It can be rolled into sheets of .0007 inch thickness, and from this beaten into leaf, equal in quality to the best leaf as manufactured in Paris. It can also be drawn into tubes or wire and spun or stamped into different shapes. It is susceptihle of a high degree of finish by polishing or hurnishing.

Aluminum becomes hard by work ing and requires frequent annealing, and if required soft, as for stamping or spinning, it must be annealed as a final operation, no matter how little worked. By forging and cold rolling it can be given considerable rigidity and temper.

Aluminum is the lightest of the commercial metals, a given bulk of it heing only one-third as heavy as a corresponding hulk of iron.

The color of aluminum is almost the same as that of silver, though instead of the dead white of silver, aluminum has a delicate purple tint Attempts are now being made to change the color of aluminum. There are reasons for the belief that many varying colors can be successfully imparted to the metal without additions which will considerably vary its chemical composition or interfere with its valuable properties. This field is an opcn one that offers valuable rewards to the successful investigators.

Aluminum for re-melting is kept in stock in what are called "waffle" ingots. They are square placques, three inches on a side and of about three-quarters inch thickness and weigh ahout one-half pound each; they are connected together with thin webs, which makes them easily detachable, in ingots which are four "waffles" wide hy seven long, weighing about fourteen pounds each. — Aluminum World.

Electrical Progress.

Electric Locomotive Performance.

The 96-ton electric locomotive has now been in operation on the belt liue of the Baltimore and Obio railway siuce August 4, '95, hauling the entire north-bound freight service of that railroad. Every train has been hauled promptly, and the locomotive has been ready at any and all bours during tbe day, causing no delay to traffic.

A few weeks ago a test was made to learn its capacity for running a loaded train on an up grade. For this purpose a train consisting of two steam locomotives, not working, and twenty-seven loaded freight cars was brought to a stop while going north through the tunnel. Here the grade is forty-two feet to tbe mile, and the rails were damp and greasy. The weight of the train alone was 1125 tons, or 1221 including the electric locomotive. Every drawbar was tigbt, no slack occurring throughout the lengtb of the train. In this condition current was turned into the motors and movement was immediately communicated to the train. At the end of one minute the train was moving at a speed of ten and one-half miles an hour, and at this point the speed was increased to the usual rate. The total distance moved in forty seconds was 150 feet, and at the expiration of one minute 450 feet.

A few days ago a test was made with a dynamometer car placed between the electric locomotive and the train wbich consisted of twenty-two cars loaded with coal, one caboose and two dead locomotives. The total weight was 1068 tons. On the 10% grade in the tunnel an average drawbar pull of some 25,000 pounds was obtained from the dynamometer diagram. The speed at this point was 11½ miles per hour. Comparison with the diagrams obtained in similar service with steam locomotives showed a remarkably uniform and steady pull by the electric eugine, due to the abseuce from it of reciprocating parts, the torque being constant throughout the entire revolution of the wheel.

A further test was made with another train consisting of thirty-six cars, one caboose and three dead engines. This was a regular througb freight train, with a local freight attached. It was hauled with ease through the tunnel, and calculation from the previous dynamometer records and the drawbar pull per ampere showed a drawbar pull of over 45,000 pounds.

A test made on October 6th has added a new record to the list of remarkable performances of this locomotive. The character of the performance is heightened by the fact that the train whicb it moved measured over 1800 feet long and weighed about 1900 tons, and was started from rest iu the tunnel. It consisted of a north-bound freight train of twenty-eight loaded cars and two locomotives coupled to a local freight of fifteen loaded cars and one locomotive. In starting not a sputter, spark or slip of the wheel ocourred, and the train moved with the same precision as if the circumstances had been of the ordinary character. The drawbar pull of 60,000 pounds was about the record in this case. The train was quickly brougbt to a speed of twelve miles an hour and pulled through the tunnel without difficulty, with the locomotive continuously exerting a drawbar pull of 40,000 pounds.

Up to the present time no train which would hold together has been found heavy enough to cause tbe electric locomotive to slip its wheels under ordinary fair conditions. The capacity of the locomotive has been by do means reached. The tests have only shown approximately wbat the locomotive can do. A dynamometer car of sufficient capacity to test the maximum drawbar pull will shortly be secured, when definite figures can be obtained.

An extension of tbe overhead works of the electric equipment north to Waverly is being planned by the Baltimore and Ohio Railroad Company. Tbe extension would secure the service of tbe electric locomotive on the grade from North Avenue. It is also contemplated to build south to Baylies, where housing for the locomotives will be built. The one now in use is at present sidetracked in the open air when not making runs.



THE ELECTRIC LOCOMOTIVE AND FREIGHT TRAIN LEAVING THE NORTH EXIT OF THE TUNNEL.

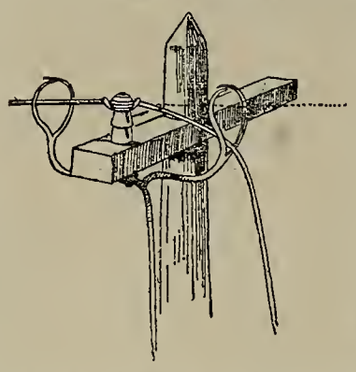
The two additional machines ordered by the Baltimore and Ohio railroad are nearing completion at the works of the General Electric Company at Schenectady, and when finisbed the passenger service through the tunnel will be undertaken by them. The illustration shows tbe electric locomotive coupled to a north-bound freight train issuing from the tunnel.

Big Electric Scheme.

The new electric light and power company organized in Boulder, Col., will take water out of Boulder creek and from there by pipe line to Cochran's mill in Eagle Rock district, wbere a power plant will be placed to furnish power and light for tbe working of mines in that vicinity. Between the falls aud Boulder four of tbese power plants are to be established, and all of tbem are to be run by water conducted in pipes. At tbe mouth of Boulder canyon a large plant is to be established which will furnish lights for tbe city and power for manufacturing purposes. It is said that the company is backed by millionaire capitalists of New York and that the Boulder organizers are merely local representatives.

Protection from "Live" Wires.

An electric current having a voltage of 1000 is dangerous. Exposed to its



full force a man is liable to fatal injury. If a wire carrying such a current sbould be broken and tbe end fall on a person so situated as to complete the circuit to tbe earth, tbe effect would probably be fatal. This is one of the reasons why, for many years, electric light and trolley wires were never permitted to carry voltages above 500. It is now becoming common, especially on arc-light circuits, to use a voltage of several tbousand.

A great deal of study has been devoted to the invention of devices which would render such wires barmless in case of breakage. Among these appliances is oue designed by A. E. Hutchins of Detroit. At a recent public exhibition of its workings he took in his bare hand and placed in his mouth tbe end of a fallen wire wbicb, previous to its being cut for the test was carrying a current with an electromotive force of 3000 volts. He then walked barefooted into a sballow pool of water, thus establishing about as perfect a contact as was possible. Had the current still been flowing through the extreme end of the wire it would have passed tbrough him to the earth and killed him. His invention consists of provision for switching the current down to the earth by a different route. On each pole carrying the wire and on each side of the supporting insulator, he placed a Y-shaped piece of metal, connecting with a ground wire running down the pole into the earth, and there attached to a water pipe or other good conductor. The line wire is made to pass between the branches of tbis fork, but ordinarily is stretched so tigbt that it does not touch. When, however, the wire is broken it falls down so as to rest in the crotch. If there be any insulative covering on the wire this is scraped off for an inch or two when the line is being constructed, so as to leave the copper bare wbere it is liable to toucb the fork, tbus insuring a perfect contact. And to prevent the wire from getting outside of the Y, the upper ends of the latter are bent over so as to close the opening overbead. When this device comes into action, in emergencies, the current flows down the pole, and the dangling end of the line wire ceases to carry electricity. It is now no longer live, but dead and barmless.

Witb tbe increasing use of elcctricity which the future, the near future, promises in all densely populated countries, the tendency will be toward higher voltages than are now common. Unless lines carrying high potential currents are put in conduits underground, therefore, some such device as that here described will be needed. It will add a trifle to the cost of a line to use appliances of this sort; but public safety will demand and legislation will require their adoption.

Edison's recent visit to Philadelphia was rumored to have something to do with a large new local electric light company, which at one end of its system shall utilize the mountainous accumulations of culm in the coal regions, and at the seaboard end shall store the current and thus generated into batteries, whence it shall be drawn off for purposes of distribution and consumption. Tbe rumor may or may not prove to be well founded, for on the one hand the utilization of culm banks has long been a pet scheme of Edison's, but on the other he has hitherto been a determined foe of wbat he used to call "wet electricity," saying, also, that the best storage battery he knew of was a ton of coal.

A big suit came up for final hearing before the United States Court of Appeals at Chicago last week, between the Brush Electric Light Company of Cleveland and the Western Electric Manufacturing Company of Chicago, involving the double carbon lamp. Tbe Brush Company claims the patent monopoly upon the carbon arc lamp of familiar use. The patent has only one year to run, but the value placed upon it is evinced in the present suit, the evidence in which is said to have cost the Brush Company $150,000 to prepare. The latter company's claims to the exclusive manufacturing right to the lamp, it appears, have not been admitted by numerous electrical manufacturing companies, about twenty of which the Brush Company has sued for infringement. Its suit against the Western Electric was, by common consent, made the test of tbe whole question. The suit was tried in May, and

decision rendered in favor of the Western Electric. The Brush Company took an appeal. In the present case $150,000 is involved, but the payment of large amounts by other companies in accounting is dependent upon it if the judgment of the lower court is reversed. The sum total of these aggregates $2,000,000.

The Danger Line.

In reference to a case reported not long ago, in which the operator of an electric mining machine was killed, as circumstances appeared to indicate, by an electric current of a potential of 280 volts—but little more than half that which has usually been regarded as the outside danger line—Richard Lamb, in a communication to the *Electrical Engineer*, says that too much publicity cannot be given to the fact that so low a pressure as 110 volts may prove fatal, if applied to a bleeding sore and allowed to remain for a few minutes. With 280 volts applied under similar conditions the person would be killed almost instantly.

The explanation which the writer offers is that the blood is so good a conductor that the current is transmitted through the arteries to the heart.

THE Standard Telephone Co., which has made a good many promising general statements, must soon begin to put some of its projects into material shape or forfeit public confidence.

Practical Information.

No More Solid Shot.

The use of solid shot in warfare has been practically given up. The projectile of to-day is a conical shell of steel and sometimes loaded with powder so as to explode by a time fuse. It is wonderfully different from the shell of twenty-five years ago. In those days one could watch the projectile as it sailed through the air in a graceful curve, at length bursting. There was even time to get out of the way, under favorable circumstances. But the new style of shell moves at the rate of a little more than half a mile a second. In striking a metal target, its energy being transformed instantaneously into heat, it becomes redhot, and a flame is actually seen to burst forth from the point struck. Such a projectile moves, one might say, in a straight line, and its impact at a distance of a mile seems almost simultaneous with the discharge of a gun.

Such a shell, passing near a man, will tear his clothes off merely from the windage. If it comes very near, though without hitting him, it will kill him. He drops dead without the sign of a wound. Whereas an old-style shell would burst into a few pieces, the modern projectile flies into a myriad of small fragments, each of them moving with tremendous velocity. It may easily be imagined that half a dozen six-pound Hotchkiss shells finding their way into a vessel would scatter death and destruction in every direction. Protective armor, owing to its great weight, can be placed only over the ship's vitals—that is to say, along the middle part of the hull, near the water line, so as to cover the machinery. In future battles gunners will direct their fire against the unarmored ends of an opposing vessel.

"How?" and "Why?"

In his address before the British Medical Association Sir William Brodbent says: "Morphia suspends the activity of the nerve centers. But how? What chemical or molecular change take place in the tissues? How is it that the slightest change in the composition of the morphia molecule radically alters its effect? The physician cannot tell. The salts of potassium and of sodium are almost exactly similar. Yet a minute quantity of the former injected into a vein will paralyze the heart and destroy life, while the latter may be turned into the circulation wholesale with no bad result. Why is it? Why is so simple a substance as prussic acid so deadly a poison? A thousand of such questions may be asked. None of them can yet be answered. We know that these things do thus and so. How they do it we do not know; but until we do medicine will scarcely become an exact science. That we shall one day attain such knowledge is confidently to be expected. That must be the work of chemistry; and when we remember that the science of chemistry is scarcely more than a century old, and when we consider the bewildering scope and importance of its achievement in that century, it is surely not too much to hope great things from its future labors."

The Female Wage-Earner.

There was once a time when it was unusual to see a girl or woman go away from her home to earn a living, and when about the only remunerative pursuits open to her were household service of some kind, sewing, millinery work, factory work and teaching. This is no longer true. The number of women, young and middle-aged, supporting themselves, and perhaps other people also, by outside employment has increased far more rapidly than that of men in the last ten or fifteen years; and there is scarcely any trade or profession in which they may not be found. The variety of factories where they are employed is greater than formerly. In such establishments, as restaurants and dry goods stores they have to some extent displaced men and boys. And one or two entirely new fields of labor, like that of operating typewriting machines in business offices, seem to have been opened to and occupied by them almost exclusively. The failure or inability of parents, brothers, sons and husbands to provide properly devotion to helpless relatives, a worthy spirit of independence and a commendable desire to prove an equality with man may be pleaded in defence of this behavior. But a number of serious problems have been raised by the industrial revolution thus wrought, and there is room for doubt whether in all respects the world is better for the change.

In some trades the women compete directly with the men of their own families. This has had two ill effects. Wages have been reduced, at least in some cases, and the family life has been broken up. An English paper, *The Realm*, speaking of the mill-hands in Lancashire, says that there is now an alarmingly great number of deaths among infants, the men are growing weak and immoral, and it is getting to be customary for husbands to rely on their wives for support. This state of things is confined mostly to the weavers, the spinners' unions have tried to keep the women out altogether, and in consequence are said to earn nearly double the wages paid to the weavers. Just how the evils here mentioned are to be corrected it is not easy to say; but the facts show that the woman question has some puzzling phases.

Strychnia and Anti-Toxine.

In his annual report to the Secretary of the Navy Surgeon General Tryon discusses new medical treatments at length. The favorable opinion entertained of the value of strychnia in the treatment of pneumonia, he says, has been further strengthened by the experience of its use during the year. Forty-six cases of acute lobular pneumonia have been treated in the New York hospital in two years with three deaths, a mortality of 6.5 per cent.

Attention is called to the number of casualties of the naval academy resulting from the present method of playing foot-ball, and it is recommended that unless the rules be materially modified no rival games be permitted.

Anti-toxine, the new serum treatment for diphtheria, has been tried at the Waghington naval hospital in two serious cases with the most favorable results and reports to the bureau from the Health department of New York show that the mortality under this treatment is only twelve per cent.

The Polariscope and Its Uses.

The polariscope is an instrument for measuring the polarization of light, or for examining substances in polarized light. By polarized light is meant light, the rays of which have been divided into two rays of equal intensity at right angles to each other. This divison of a ray of light is obtained by passing it through a prism. A second prism is then used to depolarize the divided rays, to bring them together again. It has been found that rays of light from different objects require that the two prisms should be set at different angles in every case to produce polarization and depolarization, but that a ray from the same substance will require always the same angle. The polariscope makes use of this principle. It consists essentially of a prism, which divides the ray of light, and an analyzer, to bring the divided rays together, an eye piece and a place in which is the object to be analyzed. The Government uses the polariscope to test the value of sugar. A liquid said to contain sugar is placed between the prisms. If there is a certain amount of sugar in the liquid a certain angle must be made between the prisms, while a less or a greater amount of sugar requires other angles; and if a certain angle is needed it is a sure deduction that there is sugar present of a certain amount, and only of that amount.

World's Oldest Wooden Building.

Japan possesses what is probably the oldest wooden structure in the world. It contains the art treasures of the Mikado and is situated in Nara, which for some years was the imperial residence. The building is oblong in shape and is built of triangular logs of wood. It rests on piles. The wood used is of native growth and shows extraordinary lasting power, considering the trying climate which it had to endure for over 1,200 years. A peculiar feature about the logs of which the building is construced is that, in parts most exposed to the weather, the logs are thinner by several inches than those in a more sheltered position, the wood having gradually worn away. The treasures which the storehouse contains are of great antiquity and have been seen by Europeans during only the last three years. They consist of rare and beautiful fabrics of Persian, Indian, Chinese, and Turkish manufacture and ancient articles from all parts of the world.

To Remove Putty.

Removing putty from old sashes is not so easy a job as would at first sight appear. It is almost impossible to cut the putty out with the usual hacking knife and hammer without damaging the woodwork, says a writer in the *Engineering Magazine*. To avoid these inconveniences and the danger of accidents to clothing and hands when strong acids are used a good plan is to employ petroleum—three successive coatings of petroleum, at intervals of half an hour, generally being all that is required. It may be stated as a reason for this that petroleum penetrates into the pores of the putty and dissolves the hardened linseed oil. In a short time the putty regains its original plasticity, so that in two or three hours after the application of the first coat one can, with the point of a knife, cut out the putty with ease.

THE use of petroleum for consumption is not a new idea, as it was suggested some years ago by a French physician. Dr. Pellissier, of Roumania, was led to employ the crude oil in his practice by noting that workmen in petroleum works at Campina are never infected with pulmonary tuberculosis, and he has now reported the experience of two years. The petroleum is simply freed from earthy matter by filtering through paper and inclosed in capsules to avoid creating an aversion to it on account of its unpleasant odor. The results of the treatment are claimed to be surprising. The cough ceases, the sweats disappear, the appetite and sleep return, the lesions of the lungs recover. The breath acquires the odor of petroleum, but digestion is not disturbed. Treatment through the stomach is supplemented during the day by breathing air passed through the petroleum, a Turkish tobacco pipe being used for the purpose. Efforts to administer the remedy by injection were unsuccessful.

SOME interesting information is given in the report by the engineering society of the Michigan University relative to the rusting of iron poles and the rotting of wooden ones under different circumstances and conditions, the facts going far to show the importance of careful calculations when such effects are involved. The account states that experiments with ordinary four-inch gas pipe used as trolley poles, and set in concrete up to the surface of the ground, without other coating, developed that they would become corroded through at about 10 inches below the surface in about three years, forming a black deposit. The life of white cedar poles in the clay soil of Detroit is said to be for a period of some 13 years without protection or treatment of the butts. In the same soil Norway pine poles lasted for a space of about 30 years, but were badly rotted at the surface line. They, however, rot very soon in a sandy soil, the more pitchy ones decaying first. Winter-cut poles and those cut in the summer with the sap-wood removed are more lasting than those containing green sapwood. The *Northeastern Lumberman* says that steam piping that is covered with a non-conductor, and maintained at a temperature of from 250° to 300° F., though buried in the ground, will not corrode, while a hot water return at 212°, similarly, would corrode from the outside by rusting.

ON two lakes but a few miles from Copenhagen, says the London *Invention*, a steamer capable of running on rails will be shortly seen disporting itself. The two lakes are separated by a strip of land traversed by a railway which crosses, in its course, a road, necessitating a gradient of 1.50 on either side. The rails are carried under water on a wooden structure, and the steamer, which carries two wheels fixed on either side, so as to correspond with the rails, being guided by piles, makes for the rails at full speed, travels up the incline and down the other side, where the propeller again comes into action. The small wheels at the side of the vessel are worked by a shaft and chain. A powerful brake is used in descending the slope.

ABOUT five years ago an article appeared in one of the city papers stating that when the old city bell was taken down to be replaced by the new one chalk writing was found, plainly written thirteen years before by a young engineer. In the year 1822 the bridge over the Big Gunpowder falls, at Ridgely's iron works, about fourteen miles from Baltimore, was constructed by Robert Burr, considered at that time a famous architect and engineer of New Jersey. When the bridge was erected, several persons wrote their names thereon with chalk, and they can easily be read at this day, and the date, July 4, 1822.—Philadephia North American.

TO TRANSFER the outline and tint of a leaf, take the leaf and place over a small piece of white linen soaked in sprits of niter and insert between the leaves of a heavy book with a sheet of paper to receive the impression, lay the book away for a few days, and the leaf will then be transferred color and form to the paper.

A GOOD substitute for gutta-percha is said to be prepared as follows: Tar, one part; paraffine, ten parts, dissolve together at 120°, and then add caoutchouc, two parts. Keep at this temperature until a homogeneous mass results.—London Electrical Engineer.

Mining Summary.

CALIFORNIA.

Amador.

SUTTER CREEK DISTRICT.—*Record:* At the McIntire mine, the incline is down 220 feet. At 185 feet a station has been cut and the ore chute for loading into the hoisting tubs is nearly completed. Crosscutting has begun and drifts run both to the east and west in search of the ledge or ledges which are believed to be not far distant. The incline shaft, which stands at an angle of eighty degrees bas followed the trend of the greenstone footwall with scarcely a variance of one degree from the surface to the present depth of shaft. J. A. McIntire is manager, Jas. H. Oates foreman and timberman, J. M. Benson engineer. A steam hoisting plant is in operation capable of sinking 800 feet.

Butte.

AT FORBESTOWN.—Eight men are working on the Carlisle mine and seven on the ditch to furnish water power for the quartz mill which will be erected next spring.

At the Denver the new quartz mill will be put up this fall.

In the Goldbank tunnel the work has not been resumed. Tbe mill and mine are run continuously.

Calaveras.

GENERAL NOTES.—*Voice:* At the Gold Hill the mortar blocks are being laid for ten new stamps.

The Utica Company is laying sills and preparing ground for twelve new concentrators at the Stickle's mill.

The Tborpe mine, near Fourth Crossing, is getting good prospects. They are down about 300 feet and are getting ready to sink further.

Fifty men are at work clearing ground and grading for two new ovens which are being built for the chlorination works of the Utica Company.

A mine located about one mile beyond Rohinson's Ferry, in whicb tbe Treadwells are interested, will be opened soon. They will spend $50,000 at once getting ready to sink.

A chlorination plant, costing in the neighborhood of $10,000, is in contemplation at the Jones mine. The company is getting out about four tons of sulphurets a day, running about $60 to the ton.

The *Voice* is informed on reliable authority that tbe Calaveras Consolidated, formerly owned by English capitalists, was sold to E. K. Stevenot last Saturday. The mine is located at Robinson's Ferry.

TEMPORARILY CLOSED.—The Madison mine shut down on the 16th till the rains come, throwing forty-five men out of employment.

El Dorado.

CONSIDERABLE ACTIVITY.—*Gazette:* The Two Channel Mining Company, with H. E. Picket as manager and W. C. Green superintendent, have taken hold of the Shoofly, (better known as the Kenna mine), Wilton, Tiedeman, South Otter and Yellow Jacket, besides several new locations, and altogether have now thirty men at work. The property extends from Missouri Canyon on the north to a half mile south of the Eight Mile House adjoining the Lake Tahoe road, a distance of more than four miles.

The Shoofly gravel mine, on Mount Gregory, is the old Jonas Bitters claim, purchased of Luke and Tom Morgan, Wm. and James Kenna. A building for a ten-stamp mill is going up, and part of the machinery is on the ground. It will be completed by Dec. 10tb. D. W. C. Benjamin is the millwright and Chas. Henson of Smith's Flat foreman.

At tbe Wilton mine grading for roads and digging ditches is in progress. Several miles of grading has just been completed, connecting the mines, and shortening the distance to Georgetown by four miles.

Kern.

AMALIE MINING DISTRICT NOTES.—McKay, Stuter and Stewart have filed three new claims.

The Amalie Mining Co. have completed their drifts from shaft No. 1 to No. 3 on the 250-foot level which shows ruby silver.

Sauser, Young & Co. have located and are now working on some mines near tbe head of Harper canyon having considerable ten dollar free gold in sight.—G. E. F.

GOLER DISTRICT.—The Bakersfield *Californian* says that at Goler attention is now turning to quartz prospecting, and some good strikes have been made. A lawsuit is being tried at Bakersfield over the right to extract ore from the Rand mines at Goler.

Mariposa.

THE MERCEN G. M. CO.'S PROPERTY.—*Miner:* Much of the underground operations have been discontinued for the past two weeks to enable new and larger gallows-frames to be put up at the Melvina. The new engine and hoisting plant are in position, the cages are set: they are single deckers but will be changed to double as soon as sinking is over with. The wbole mechanism and appliances are compactly grouped in a building 130x40 feet, an iron frame affair covered with corrugated iron.

The Black Creek dam is nearly finished. The only important part not yet under way is the cement work to be done on the upper side where the timbers rest on the bedrock. The greatest number are now employed a little below the dam on the new forty-stamp mill, the contract for which has been let for some time. At the Mary Harrison mine the old incline shaft has been practically abandoned and a new perpendicular compartment one started, its location from the old one is about 500 feet northwest. The engine formerly at the incline has been moved down and the grading for the necessary buildings near the new one about completed. The boilers and pumps are left at the old workings to keep them dry. The Louisa is undergoing the same general change in the line of improvement except that sinking has not been stopped there yet. Machinists are busy as elsewhere putting the mechanism together.

Modoc.

SAID TO BE TIN.—In Modoc county, fourteen miles from the Oregon line and twelve miles from the Nevada line, is a blow-out of peculiar looking black honeycomb rock covering a space of 320 acres, with deep canyons and perpendicular cliffs. This rock contains a white metal, says the Redding *Free Press*, which seems to be tin. An intense heat burns it up; a moderate heat causes a metal to run out of the rock which appears like solder. Parties in Redding have several locations in this belt, and mining experts have examined it. An assayer, to wbom a sample was recently sent, says that tbe metal is tin of good quality. No later than Saturday some of the ore was heated by Mr. Hough, and the metal run out. If it is really tin, tben Modoc has one of the most extensive tin mines in the world. Time will prove its value or worthlessness.

Nevada.

RICH ORE.—*Herald:* The Providence company has found splendid ore in the south end of their mine, wbere they are working in virgin ground. In the 1350 level, about 1400 feet from the shaft, some beautiful specimen ore has been taken out. Besides the high-grade sulphurets it contains it is spotted with free gold.

AROUND INDIAN FLAT. — *Transcript:* The Mt. George, owned by Frederick Zeitler and John F. Kidder, gives promise of becoming a dividend-payer; at a depth of 200 feet they drifted north and south on the ledge, which is now four feet thick and improving. The walls, which are of greenstone, are clean and well defined, and the ore is easily broken down. Half a dozen miners could keep a ten-stamp mill running there, and it is the intention of the company to have one before long. H. Pengelly is foreman, and with a small force of men he is working night and day. Tbe company have about 500 tons of ore on the dump, and are hoisting quartz every day.

THE STANFORD.—Tbe Stanford mine is down over 300 feet. The ledge if coming in stronger as depth is attained; their rock will average $20. About twenty men are employed, and they keep ten stamps running.

PIPE AND POLE LINES. — The Providence Mining Company's pipe line is all graded out, trenches cut where necessary, and the pipe has been strung along over the ground, ready to be put together.

The Electric Power Company's linemen are setting up poles and "brushing out" a road for the same, and is now pretty close to town. The line running to Grass Valley can be seen running up over the hill on tbe south side of the creek, and the wires are now being stretched.

The Champion company will soon begin work on their new dam in Woods ravine.

THE PROVIDENCE.—The shaft at the Providence is now 1800 feet deep—one of the deepest gold mines in the world. At a depth of 1780 feet a drift has been run south 600 feet on the front ledge, which is six feet of sulphuretted ore. Sinking will be continued.

Placer.

A NICE LITTLE NUGGET. — *Sentinel:* Tbe Alta gold mine at Alta, of which W. A. Doolittle is foreman, produced a $72 nugget last week. It's getting to be a regular thing in the mines about here to pick up such pieces.

Plumas.

READY FOR THE WINTER SEASON.—*National-Independent:* The Quincy Mining & Water Co. bave finished at Gopher Hill the reservoirs and ditches in readiness for active work next February.

At Gopher Hill the restraining dam which did such good work last season has been raised five feet, with rock and gravel, thus increasing the storage capacity to such an extent in the impounding reservoir above the dam that the company will have no trouble next season in restraining and impounding safely all the debris from their mine.

Riverside.

GENERAL MINING NOTES. — *Record:* The English company is working zealously on a number of its claims in the Gavilan country and they are showing up in fine shape. Edgar Battye finished a contract on one, a mile north of the Santa Rosa, this week, and from all accounts it is a promising prospect. He sank a sixty foot shaft, at the botton of wbich he drifted north and south 100 feet. The drift has opened up a fine ledge over a foot in width and it assays well. The company is running tbe Santa Fe mill nigbt and day on ore from its claims, and tbe results are said to be entirely satisfactory.

Messrs. Hutchinson, Murphy and Moulton have put up a whim on the Leona, an extension of the Santa Rosa, and will begin sinking on the mine next week. J. B. Dennis has recently moved the old Santa Rosa mill to the Indian Queen mine and expects to have it in operation in a short time. The company that Mr. Dennis represents own a number of good claims in the vicinity and as soon as development justifies it they will put up adequate works.

The framework for the Santa Rosa company's additional ten-stamp mill is now up, the foundation for the mill in, and the work of putting up the machinery will begin at once. The latter is now on the grouud.

Efforts are again being made to straighten out the affairs of the Santa Fe Mining company, and if successful the mine will be started up under new auspices and will have considerable capital to back it.

The miners who have leased ground in tbe Good Hope mine are all making big money, and all regret that their leases will soon expire. A number of them are making from $7 to $10 per day. Nearly all of tbis rich ore has been taken out of the ground that was abandoned years ago and many of the drifts had filled up with debris.

San Bernardino.

ON THE DESERT.—J. Ingersoll, owner of the Gypsy mine, Virginia Dale district, near Twenty-nine Palms, left San Bernardino last week with a supply train of three wagons, with 12 horses and 16 men, in addition to machinery and camp equipage. They carried supplies for two months for the wbole force. At the Gypsy mine the ore runs from $40 to $125 per ton in free gold. The mine has already been worked to a limited extent and the owners bave had a little stamp mill run by a gasoline engine at the mine since last spring. The mill will be added to and its capacity increased during the winter.

PROSPECTS FOR THE ALTURA.—*Sun:* Tbe 10-stamp mill for the Altura mine at Holcomb valley has been put in place and will start up next Monday with 400 tons of low grade ore, that will run from $5 to $10 per ton, on the dump, and with work so arranged tbat enough more can be supplied to keep the stamps pounding away for the season. This mine is situated in a bluff, at the foot of which stands the mill, on Antelope creek, where there is plenty of water, and as the ore is obtained by tunnels into the mountain, and not by shafts, the cost of getting out the ore and milling it is so light that even on this grade of ore tbere is a good profit. The mining and milling only costs $1.50 per ton, and at that figure even the $5 ore will pay. The ore is run out from the levels, of which there are three, direct to the mill, the bluff rising 1000 or more feet above the mill at an angle of over 45 degrees. It is a gold-bearing, free-milling ore and is easily worked.

San Diego.

AT JULIAN.—Horace Crinklaw, one of the owners of the Gold King group of mines, consisting of the Gold King, Gold Queen and Cincinnati Belle, is arranging for opening all three mines.

Tbe Ready Relief Mining Company has sunk a shaft on the Redman mine to a depth of 130 feet, and commenced drifting both ways on the ledge. The east drift will be under the creek and will connect with the Ready Relief mine 150 feet below the lowest levels of the latter. A raise will then be made to make tbe connection complete.

Shasta.

THE GLADSTONE MINE.—The Gladstone mine is still closed down awaiting a settlement of arrearages.

Siskiyou.

THE SCHROEDER PROPERTY.—*Journal:* The fire at the Schroeder quartz mine will not interfere with the deal under consideration from an English syndicate in its purchase. The English syndicate has several million dollars to invest in gold mines, about a million and a half for California, the Shroeder mine heing the first bargain to receive their attention. This a very valuable mine, and will undoubtedly prove a permanent and valuable gold producer for a long period of time, comprising several ledges in close proximity to each other. Tbe syndicate agent really prefers that no buildings be put up until he can decide about purchase, as a different style of buildings and larger mill would be erected if purchased.

GOOD REPORTS FROM MINING CLAIMS.—*Journal:* Espey, Hunter & Co., at their Hawkinsville mining claim, expect to realize about $5000 for the short time the mining has been carried on.

The Steamboat mine, at McAdams creek, worked by Brokaw & Co., prospects handsomely, with gold coarser than heretofore. The new owners are so well satisfied with the returns so far realized that they feel justified in going on with the construction of the drain towards Fort Jones, in order to free the claim of water for working the bedrock to good advantage.

The quartz mine of A. G. Myers in Quartz valley is turning out very rich. The Colonel will put up a mill to work the ore.

NEVADA.

ESMERALDA COUNTY.

SAID TO BE A FIZZLE.—The long deferred payday has not reached Silver Peak. The Howthorne *Bulletin* says: Last Friday the C. & C. R. R. Co. attached a bar of bullion that was shipped by L. J. Hanchett from Silver Peak. The attachment papers were served on the Wells-Fargo agent here, and the bullion was detained at this place. It is reported that Hanchett is indebted to the railroad company for a large amount. We are informed that John Chiatovich bas attached the ore, amalgam and otber property of the company at Silver Peak for debts owed.

This is a most unfortunate condition of things, and will probably result in the closing down of the mines and mill at the Peak. Rumor bas it that the men working at the mines have not been paid for several months, and they will be obliged to pack their blankets and strike out witbout a dollar in their pockets.

Late reports from the mines are very favorable, but unless Mr. Hanchett can settle the attachments, which is doubtful, he will be obliged to suspend operations.

ON THE COMSTOCK.

CON. CAL. & VA. REPORT.—Supt. Lyman, in his annual report of the Con. Cal. & Va. M. Co., dated Oct. 1st, '95, says the entire yield of the company composing the present corporation in full to October 1st, '95, per assay value, has been: gold, $61,672,168.41; silver, $69,753,805.92, or a total of $131,425,974.33. The dividends paid by the various companies composing the present corporation are: California, $31,320,000; Consolidated Virginia, $42,930,000, Consolidated California and Virginia, $3,898,800—a total of $78,148,800.

The annual report covers twelve months preceding September 30, '95, during wbicb time there has been extracted from the 1650-foot level down to the sill floor of tbe 1750-foot level of the mine 10,255 50-2000 tons of ore, all of whicb has been milled by the Comstock Mill and Mining Company at the Morgan mill, and from this ore there has been produced bullion of the assay value of $491,807.64, which shows an average yield of $47.97 7-10 per ton. This bullion carried $250,730.33 in gold and $241,077.31 in silver. The coin value of tbis bullion amounted to $364,526.56.

STATEMENT OF RECEIPTS AND DISBURSEMENTS, FROM OCTOBER 1, 1894, TO OCTOBER 1, 1895.

Cash on hand last annual statement		$34,185 69
RECEIPTS.		
Salaries and wages		5,618 43
Mining supplies—		
Timber and lumber	$5,055 49	
Wood	381 65	
Ice	14 61	
Oils and lubricants	4 00	
Candles	25 74	
Iron, steel and hardware	246 27	
Pipe and pipe fittings	273 26	
Drills, fittings	31 32	
Powder, caps and fuse	75 00	
Miscellaneous	1,158 50	
Total		7,265 84
Water rent		89 20
Transportation and hauling		119 87
Assay office—		
Ore tailings and slime assays	1,335 68	
Assaying and melting bullion	141 68	
Supplies	9 75	
Total		1,486 43
Term expense		343 76
Office expense		1,767 48
San Francisco—		
Superintendent's drafts Nos. 901 to 920 inclusive	119,741 27	
Coin from Carson Mint—returns from bullion	191,070 04	
Total		310,821 01
Total		$361,690 01
DISBURSEMENTS.		
Salaries and wages		122,245 10
Mining supplies—		
Timber and lumber	17,347 80	
Wood	15,505 69	
Ice	2,859 40	
Oils and lubricants	1,063 87	
Candles	3,045 75	
Iron, steel and hardware	516 26	
Pipe and fittings	1,063 42	
Drill fitting	31 50	
Powder, caps and fuse	4,150 60	
Miscellaneous	4,107 27	
Water rent	5,520 00	
Freight on bullion—to Carson	276 30	
Freight on bullion—from Carson mint	18 80	
Transportation and hauling	530 67	
Compressed air furnished by adjoining mines	1,221 59	
Surveying	300 00	
Assay office—labor and supplies	7,003 74	
Team expense	605 90	
Office expense	3,619 10	
Legal expense	417 95	
Reduction of ore	70,510 51	
Hauling waste — through Comstock tunnel	5,071 20	
Comstock tunnel royalty	16,386 97	
State and county tax on net proceeds	10,023 82	
State and county tax on property	8,382 60	
Medical-funeral expenses	5 00	
Total		175,585 31
DISBURSEMENTS.		
The 1100 level.		
Salaries and wages	1,116 15	
Mining supplies—		
Timber and lumber	$317 68	
Wood	270 00	
Ice	12 00	
Oils and lubricants	4 00	
Candles	18 95	
Iron, steel and hardware	41 00	
Powder, caps and fuse	75 00	
Miscellaneous	91 20	
Total	829 83	
Water rent	79 70	
Hauling	55 00	
Total		2,080 68
Exchange—		
On superintendent's drafts; amount, $87,710 12	259 25	
On mint drafts on Sub-Treasury; amount, $172,322 28	861 55	
Total		1,120 80
San Francisco office—		
Transferred by telegraph in January, 1895	60,000 00	
Amount received from Ophir, Mexican and Andes Mining Companies	658 12	
Total		60,658 12
Total		$361,690 01

WHITE PINE COUNTY.

AROUND HAMILTON.— White Pine mining district has this year shipped about 1000 tons of ore that yielded about $36,000. Tbe ores shipped have about paid food, sacks, sacking, packing, teaming, railroading and smelting.

The Horn Stake mine has yielded this year about 750 tons of silver carbonate lead ore that goes 65 to 70 per cent lead and from 14 to 20 ounces silver per ton.

OREGON.

THE HAMMERSLY MINE.—There are three engines now in operation at the Hammersly mine at the head of Jump-off-Joe. One is used for a saw mill; one for the hoisting apparatus. A three-foot vein of rich ore is now being followed at a depth of 240 feet. Five more stamps were hauled in last week, making ten in operation.

GRANT COUNTY MINES.—At Long Creek, in Greenhorn district, at the Ruby mine a ledge has been struck which runs to $400 a ton. Two men are working the Bennett claim and are taking out enough gold to pay the expenses of the claim. At Granite the steam shovel has been stopped until spring, but nevertheless, a good deal of work is being done at the Bellevue mine, but employment is given to only ten persons.

AT THE SANTIAM MINES.—The big boiler for the Santiam mines is at the summit, within eigbt miles of the mines. About sixty men are getting out ore.

The Annie mine, in the Bohemia district.

Cottage Grove, which went into Receiver F. S. Younger's hands nearly a year ago, has been sold to a Chicago syndicate. The Annie is considered to be the most extensive quartz mine in that district, and contains a large amount of free milling ore.

SPENDING CONSIDERABLE MONEY.—Apostle Heber J. Grant, of Salt Lake, is at the head of the Grant Bros.' syndicate operating mines in Baker county, Or. The money expended by the brothers in the Granite district alone last summer amounted to fully $60,000.

IN SOUTHERN OREGON.

Z. A. Moody is driving a tunnel at the Edna mine, in the Ashland district, and is in 60 feet.

Swinden & Hayes have completed a ditch at their mines on Oscar creek, Josephine county, and are ready for wet weather.

The new mills at the Steamboat and Beekman & Huffer mines will soon be crushing ore.

The Jacksonville *Times* says: "All that is needed to make southern Oregon forge to the front as a gold-producing section is a wet winter. More mining will be done than ever before in that event."

The Hicks Milling Co. at Ashland will commence crushing ore from the Tolo mine as soon as a boiler for heating purposes is put in. They will also work a large amount of second grade ore from the Ashland mine.

F. Stith, at the Free and Easy mine in Kerbyville district, will put in 1200 feet of flume to run the quartz down the mountain to the arrastra.

Grayson & McCumber are developing the Anderson-Holyoke mine in Williams creek district.

At the Black Gold Channel Tunnel Co., Foots creek, the tunnel is in 1000 feet, with a number of crosscuts. There are 30 men employed and the force will be increased to 50. Hoisting works, an electric light plant and 3000 feet of rails for the new incline will be ordered.

WASHINGTON.

CLEANED UP $9000.—William Blewett took a lease on the Blewett mines in the Peshastin district from his brother a month ago and has cleaned up in that time $9000. The free milling ore goes $17 to the ton, the concentrates from $95 to $250. The properties are well developed and equipped with a twenty-stamp mill with power for forty stamps. They are now putting in four tanks for the cyanide process. By this means they can handle twenty tons a day.

BRITISH COLUMBIA.

SHUT DOWN.—At Ainsworth the No. 1 mine has shut down, apparently for lack of funds. Supt. Dan McVicar, with his force of forty-six men was let out on the arrival of Mr. Moysher, the new superintendent from Nova Scotia.

NEW MINING COMPANIES.—Following are recent mining incorporations: Main Quesnelle Gold Dredging and Mining Co. Ltd., incorporated at Tacoma; capital stock $250,000; Robt. Thompson, Ont., president; F. B. Fox, Tacoma, secretary-treasurer; and E. J. Fader, general superintendent, Quesnelle, B. C.: object of company is to take over the Fader Mining Company's business, carried on by dredging. Virginia Gold Mining Co., capital stock $500,000; office Spokane, B. C.; office and place of operation, Rossland; James Clarke, agent. Silverine Mining Company, foreign, Spokane; capital stock $500,000; place of operation, in British Columbia, Rossland; J. B. Arthur, agent. Richmond Developing and Mining Co., Vancouver, capital stock $120,000. Dominion Development and Mining Company, Vancouver; capital stock, $500,000.

THE DEAL CLOSED.—The option offered by Mr. Barnard's English Hydraulic Power Company, on Seymour creek is reported closed. The first of the $300,000 to be spent in utilizing the water power of Seymour creek has already been disbursed and the work will be started soon, it is said, on a large scale.

BUILDING A RAILROAD.—F. A. Heinze is building a railroad from Trail Landing to Rossland. He says the government gives him a subsidy of 2000 acres to each mile of road, and a subsidy of two square miles for building the smelter, which is almost finished. The process of smelting will be a combination of matting and blast furnace. Wood will be used instead of coal, and coke be brought via the Canadian coast over the Canadian Pacific.

IDAHO.

At Buffalo Bar, eight miles from Lewiston, beach miners have uncovered an old deposit of gravel which is rich in flake gold. The pay streak is 25 feet thick and men are making as high as $8 a day with rockers.

This discovery has awakened new ideas of the possibilities of the river bars throughout the gold belt.

Thirty years ago all the gravel deposits on the short side of the short curves in the rivers afforded gold in paying quantities. All of the favored locations were run over and then abandoned. It is a well known fact that river channels within banks of sand are constantly changing. The old beds are, of course, covered deeply with surface waste from the hills and have never been prospected.

The discovery at Buffalo Bar is one of these deposits, which must have counterparts everywhere.

On the reservation, below Greer's ferry, the Chinamen took $20,000 from one bar in one year. At the mouth of Alpowa, six miles below this city, were $15 diggings 20 years ago. There have been very many such bars worked out and passed over, especially on the reservation. The Indians have protected these bars for 20 years. It is within the range of possibility that the reservation placers will attract many miners to work these old river beds.

CŒUR D'ALENE NOTES.—The water problem is a serious one in the Cœur d'Alenes at present. The mills depending upon a water supply have in many cases been compelled to close down. A number of reservoirs are being built this fall, and they will greatly augment the supply.

The lack of water is seriously interfering with the working of the Hunter mill. As a consequence fifty men were laid off last week, as the stopes and chutes were full of ore and and the mill could not keep pace with the mine.

F. R. Culbertson, manager of the Tiger and Poorman consolidated properties, is gradually putting a few more men to work on the Tiger. There are a great many improvements and changes to be made, however, before the consolidated properties will be in readiness to employ a full crew. On the Poorman side Harvey and others have leased the upper workings and will use the Poorman shaft as occasion requires. The Tiger and Poorman properties will be worked from the Tiger shaft.

The changes and improvements at the Morning, including the new engine and boiler at the concentrator, are progressing satisfactorily, says the Cœur d'Alene *Miner*. They are bricking up the boilers and preparing to put in the engine. The building has been framed and will be erected as soon as all the machinery is in place. About fifteen men find employment around the concentrator. At the mines there is, of course, nothing but development work in progress. There are about twenty-two men working on the You Like, including those employed on the tramway which is nearing completion. There are twenty-five men at work on the Morning.

The Standard mine in the Cœur d'Alenes is one of the most remarkable properties in the Northwest. It is owned by John A. Finch and others. During October it paid $95,000 over and above all expenses, and there is enough development in the property to warrant such returns every month.

FINDING THE LEDGES.—It seems that the old camp of Florence is destined to again become a great producer. All old-time miners will remember that it was the first placer camp discovered in Idaho, and that it was probably the richest ever known in the territory. The returns were marvelous, but the ground was soon worked out, the pay being found up in the hills rather than in the gulches. The origin of the gold has always been a mystery, but miners have always believed that rich ledges existed there. From reports it appears that the ledges are being discovered; they show no outcrops, the prospectors being guided by streaks that they find in the wash. Following these, they come upon seams, which uniformly widen as they are sunk upon. A custom mill has been erected there, and ore from a number of claims has recently been milled. The returns vary, but some rich rock has been treated.

THE TIGER AND POORMAN.—*Miner:* The Consolidated Tiger and Poorman mines have now 125 men on the payroll, of whom about seventy are working directly in the mine, some taking out ore and others working on development. A crosscut is being run on the 1100-foot level to connect the vein with the bottom of the Tiger shaft, which are about seventy-five feet apart on that level. This has been carried about fifteen feet so far, and it is expected that the vein will be reached about December 1. The ore is coming from the 900 and 1000-foot levels.

THE FRISCO MINE.—The Frisco mine got under full headway again on Monday last, the concentrator being started up on both shifts on that date.

There are now about 105 men on the Frisco payroll, and this includes a few who are finishing up some outside work, such as building a powder magazine, fitting pipes and so forth. In a very short time the working force at the Frisco will be reduced to 100 men or less in place of about 155 men who were on the payroll before the new machinery was added. Thus a daily saving is effected of the wages of fifty to sixty men, amounting to about $200, so that the new compressor plant will pay for itself in about six months. There is not a single drill used anywhere in the mine.

MONTANA.

THE PRIZE MINE.—Harry and William Murray have sold the Prize mine, in Deer Lodge county to New York parties, the consideration announced being $100,000. There has been paid $15,000 on the deal. The Prize mine is located at Cone Butte, Deer Lodge county, a few miles from the Jay Gould. A 10-stamp mill is on the property and has been running two years. The ore is free milling gold and the vein a strong one. The new owners expect to erect a larger mill and work the mine on a more extensive scale. Murray Bros. developed the Prize mine from a prospect. They sold the Bell Boy to an English syndicate for $40,000, and then commenced work on the Prize mine.

CLARK'S LATEST PURCHASE.—W. A. Clark of Butte has bought W. Bennett's interest in the Royal gold mine; the money has been paid. Clark gets 121,000 shares out of a total capital stock of 350,000. The price paid is not yet furnished the public. The road from Deer Lodge to the mine is to be completed and the property worked to its fullest capacity.

The Royal is at the head of Boulder creek, a small stream that puts into Flint creek, and is said to be the greatest gold mine in Montana. Nelson Bennett, Willard Bennett and Conrad Kohrs spent nearly $100,000 in its development and in the erection of a 10-stamp mill. The ore averages $32 per ton and has paid dividends since the fall of 1893 at the rate of $200,000 per year, or about $17,000 per month. It is said there is enough ore in sight to last five years.

THE INDIAN QUEEN.—*Inter-Mountain:* At Birch creek, eight miles above Apex, the Indian Queen copper claim is being operated. The ledge is said to be from 150 to 200 feet in width and the outcroppings can be traced for about two miles, running northeast by southwest. The Indian Queen was first worked by Col. P. R. Dolman of Butte, who took out a few cars of copper ore from within 60 feet of the surface. The hanging wall was in lime and the foot wall in granite. An expert from Butte was called to make an examination of the ground for one of the big copper companies of Butte, but he condemned it because of the formation. The shaft is now 200 feet in depth, but the ledge has not been crossed to the walls. At 100 feet four feet of the ledge will assay 22 per cent copper. On the 150-foot level there is a better showing, and at the 200-foot level a crosscut south shows copper glance. As yet the shaft is perfectly dry and sinking will be continued to below water level. The lessees recently refused to rebond the property for $150,000 to the same company which had been offered an option for $75,000 three months ago. W. A. Farlin and brother of Butte, the owners, and Frank Bennet & Co. hold the lease and bond for $40,000. They expect to take out enough ore in a few months to raise the bond.

OWNERSHIP OF A VEIN.—At Helena, the Supreme court has made a decision in a mining case in which Hon. W. A. Clark, chairman of the National Bimetallic committee, was the defendant. The decision of the Third Judicial District court in Butte was affirmed, which was against Clark, compelling him to pay $40,000. The decision decides the ownership of a vein which dips under an adjoining claim. The Niagara and Black Rock claims adjoined, running east and west, the former on the south. The apex of the vein in controversy passed through the west end line of the Black Rock and crossed the common side line 513 feet westerly from the east end line of the Black Rock, and continues across the Niagara, passing out of the east end line thereof. The vein dipped to the south. The Black Rock extracted ore from that vein on the dip at a point under the Apex, which is on the Niagara and south of the perpendicular plane sunk into the earth at the common side line. The lower court decided that the Niagara people were entitled to an accounting against the Black Rock for ore taken from the dip of the vein under the Apex, which was on Niagara ground and east of the point where the apex passed wholly within the Niagara premises.

UTAH.

TO SAVE MORE GOLD.—President John Beck of the Bullion-Beck mine in Eureka says that, in place of the proposed amalgamation plant, the company has constructed a large reservoir at the foot of the dump, in which all the water from the concentrator is deposited and settled, and the surface water, which carries chlorides, is again pumped up to the mill to be used the second time. By this method it is hoped to save practically all the values in the ore, as the sediment in the reservoir will carry nearly everything that escapes the vanners in the mill.

CAMP FLOYD DISTRICT.—An enterprise recently projected is that by H. M. Ryan of Chicago, who believes that an immense blanket vein, many miles in extent, underlies the entire Camp Floyd district, and that to strike pay ore anywhere it is only necessary to dig a hole deep enough. He has secured control of thirty-seven claims situated in different parts of the district and proposes to send a drill down on each of them. His theory is shared by many mining men. In his undertaking he is backed by Chicago capitalists, who have placed $125,000 at his disposal for preliminary work. Mr. Ryan is one of the incorporators of the New Bassick Mining Company, which is contending in the Denver courts for possession of the famous Bassick mine. The extent of the Camp Floyd gold belt is constantly being increased by new discoveries far beyond what was originally supposed to be the limit of the mineral bearing district. The five-mile pipe line was completed during the week and an abundance of water is now delivered to the camp. The water is pumped up to the top of a divide 1,700 feet by power furnished by the stream from which the water is taken. The Sunshine cyanide mill of 150 tons capacity, which has been completed for two months, awaiting the water supply, has been started up. This is the fourth mill for the district.

THE STERLUS AND AMANDA.—The Bingham *Bulletin* learns from O. B. Hardy that he has organized the Bingham Copper Company, which will operate the Starlus and Amanda groups. He says that 3000 feet of piping with which to pipe water to the mines for air has been ordered, and that it is quite likely that Rogers Bros.' hydraulic air-blast will be put in. A new 150-ton ore bin is now being built, and every preparation for increased and vigorous operations is being made, and it is the aim of the company to erect a concentrating mill on their ground as soon as a satisfactory mill test of the ore can be obtained. The Starlus is now in such shape that it can be made to produce from thirty to forty tons of ore per day, and the Amanda ore body is improving daily.

Regarding the electric plant to furnish lights for the canyon, power for operating mills and tramways and also an electric railroad between Bingham and Salt Lake—the enterprise in which he is individually interested and is backing—Mr. Hardy says negotiations are now going on for power to operate the plant, and that the erection of the plant at no distant time is an assured fact.

COLORADO.

NEW MILL IN THE LA PLATAS.—At Durango has been erected a mill for the treatment of gold ores by the Bromine gold extraction process. The mill was built by Messrs. Pret, Trasbier & Co. The plans and designs were made by F. Crozier and E. C. Englehardt.

The ore from the crusher goes into a revolving dryer, thence through an elevator to an automatic sampler, thence to a revolving screen. Here it is separated to a certain fineness, the fine part going to the roaster and the coarse part going to the rolls, from which it again goes to the screen and on the roaster. From the roaster it is carried to the extraction barrel, where it is kept for several hours, being in motion all the time. The solutions are allowed to settle in two settling tanks, the gold in solution is precipitated, the solution having first been conveyed to the precipitating tanks, the motion of the liquids being made by compressed air and water, or by natural fall. The gold precipitation is gathered in a filter press, and from there taken to the clean-up, containing smaller roasting, melting and refining furnaces. The ore in its travel through the mill is carried by a series of elevators. This process is somewhat similar to the chlorination process, using bromine, instead of chlorine, as solvent for the gold. Where the latter process demands from fifty to sixty pounds chemicals per ton to produce the necessary chlorine, the bromination process uses 1 to 1½ pounds per ton.

SAN JUAN COUNTY.—*Herald:* There are now over 1,300 men employed in the mines in San Juan county, at least 400 more than at any time in the history of the county. No one complains of hard times and merchants as a rule are feeling cheerful over the business they are doing. Even the little camps, which, were almost deserted two years ago, are showing signs of active life. Mines that have lain idle for years are being worked at a profit and the next twelve months will note the starting up of many which were patented and abandoned ten and fifteen years ago.

TEARING UP CLEAR CREEK.—After making preliminary preparations almost the entire year, and spending upwards of $60,000 on its plant, the Clear Creek Gold Mining and Water Power Company has started its giants at work and the bed of Clear creek is being torn up. This company owns the placer grounds all the way from Forks creek to Golden, and intends working every foot of the property. It is claimed that the proposition has already demonstrated that it is not only a profitable one, but markedly so.

The hydraulic pipe is 1100 feet long and 44 inches diameter at the opening, narrowing down to 18 inches. From the 18-inch pipe two others are taken off—one 18 inches itself and the other 12 inches. These giants have a pressure of 84 pounds at the nozzle. Boulders ten inches through are shot up an incline pipe like pebbles. The pressure is obtained by a fall of 150 feet in the 1100 feet which the hydraulic pipe travels. The sluice-boxes are 200 feet long; there are eight of them, each four feet wide. The riffle blocks are eight inches high, eight inches wide and two-thirds of an inch apart. The spaces are filled with mercury to a depth of four inches. At the end of these sluice-boxes is another 200 feet long, and in it is a grating three-fourths of an inch apart at the top, bars upright, but narrowing toward the bottom like a fan. Beyond this box is still another, where runs an undercurrent of gently flowing water with 1½-inch riffle blocks, three inches high, the top capped with flat iron straps which are slightly wider than the surface of the riffle, so that water flowing over and dropping into the riffle space churns the gold. Before the gravel is discarded, it is turned into another sluice-box, 48x24 feet wide, divided into boxes four feet wide and running the entire length, each of which is floored with carpet and fitted at the opening end with a gate. The flume to operate the plant is 10x6 feet and 2600 feet in length. The raceway is 700 feet long, making an uncovered space of 3300 feet.

THE FLORENCE CYANIDE PLANT.—President Moffat of the Metallic Reduction Co. says the cyanide plant at Florence is to be extended at once to a capacity of 400 tons per day. This is one of the reasons for the advance in Anaconda stock, as the great bulk of the ore taken from that mine is treated at Florence. Including transportation from Cripple Creek, the present cost of treatment is $8 per ton.

SOUTH DAKOTA.

THE GOLDEN REWARD DEAL.—*Times:* We have it from an excellent source of information that the deal was closed about a week ago and the price was $1,500,000, the first payment having already been made. All of the properties listed were not sold, the price for the entire property being $1,800,000. John D. Rockefeller, the multi-millionaire, is said to be the purchaser.

MICHIGAN.

A BIG DEAL.—It is reported from Iron Mountain that the Chapin Mining Company has secured control of the Ludington and Hamilton. The Ludington and Hamilton were flooded four years ago and have since been idle. When active they employ 1500 men and can send to market several hundred thousand tons of ore each year. With the Chapin mine and its other properties the company can produce half a million tons of ore annually.

NEW MEXICO.

AROUND SILVER CITY.—*Sentinel:* A 1000-ton ore bin is being built at the Copper Queen mine at Cooney. As soon as finished, grading will begin for a 15-stamp mill.

Iron mining has been started at Hanover again since the Silver City & Northern R. R. has been repaired, and four cars of iron ore are being daily loaded and shipped.

The Ivanhoe smelter is working steadily, putting through 45 tons of ore a day. The company is employing 125 men.

Development is being steadily pushed on the Maud S. mine at Mongollon. A strike of some very rich ore has been made in the bottom of the mine within the last few days. Manager, Col. E. C. Bennett; foreman, R. E. Guntber.

The Mineral Point Zinc Co. has resumed work at Hanover, and restarted shipments with a car of zinc ore yesterday. The ore goes to Mineral Point, Wisconsin, and other shipments will follow regularly. Arrangements are being made to open up and ship ore from other zinc claims in this district. Before the washouts on the Silver City & Northern road took place arrangements were being made for large and regular shipments of zinc ore from here to St. Louis, Mineral Point and several other zinc smelting works in the

United States. The washouts broke up the negotiations, but they are now being resumed and numbers of valuable idle zinc mines here are expected to be producing within the next few months.

ARIZONA.

A NEW MILL.—The *Eye* chronicles the arrival of T. D. Gray, who it says will build a 50-stamp mill "near Ehrenberg."

SHANNON'S COPPER MINE.—C. M. Shannon is working his copper mine and disposing of 200 tons a month to the Arizona Copper Company, at Tucson, Ariz.

PIMA COUNTY.

THE MAMMOTH.—Thos. L. Bailey, superintendent of the Collins group of mines, adjoining the Mammoth, on the San Pedro, tells the *Citizen* that publicity of operations at the mine draws men there in search of employment and he has none to give: that the foundation for the mill is completed and the machinery for the same nearly all on the ground. The pump at the river has been put in place on the San Pedro. It has a capacity of 100,000 gallons in twenty-four hours. The pipe line between the pump at the San Pedro and the reservoir at the mine is three miles in length and is of three-inch pipe. The reservoir is cement lined and has an elevation of 850 feet above the river level. In the mine the work of development is being pushed ahead. The main working shaft is now down 300 feet and a winze driven from the surface is nearly of the same depth. When completed crosscutting will begin and the extent of the big ore body determined.

YAVAPAI COUNTY.

PLANET-SATURN CO.—At Fool's gulch the Planet-Saturn Co. have begun work on their claims. At the bottom of their 90-foot winze they have five feet of solid quartz which is rich in sulphide ore. These sulphurets, when freed from the quartz, go as high as $2000 per ton, and the quartz just as it is taken out, without any sorting whatever, runs very high in gold. There are about 5000 gallons of water per day running into the mine at present, which gives assurance of ample supply to run the mill as greater depth is obtained.

LOWER CALIFORNIA.

NEW MANAGER.—*Lower Californian*: A new manager has been appointed for the Progresn mining company, whose extensive properties are about fifty miles north nf La Paz. The new official has power to thoroughly test the capacity of the mine, and if everything proves satisfactory will give permanent employment to 1,000 men.

MEXICO.

A LARGE REMITTANCE.—The Anglo-Mexican Company of San Jose de Gracia, State of Sinaloa, has remitted to the mint of Culiacan six bars of bullion of which the gold was worth $115,686.25 in gold and the silver $2,810.90

Commercial Paragraphs.

MARSHUTZ & CANTRELL this week shipped two steam locomotive cranes to Guatemala.

THE Pacific Lumber Co. is building the largest redwood mill in the world at Scotia, Humboldt Co.

THE Pacific Iron and Nail Company is fittiug up a nail factory in which they will install fifty cut-nail machines.

THE Fulton Engineering and Shipbuilding Works will furnish the engines for the Sutro baths at the Cliff House, at a contract price of $6000.

IT is worthy of note in these days of swifts and scorchers that the Golden State and Miners' Iron Works of this city made bicycles here thirty years ago.

FRANK L. BROWN, of the Washburn & Moen Co., sent this week a cable to Seattle, 1⅛ inches diameter, 20,000 feet long, for the Front street railroad line in that city. It weighed 69,180 pounds.

THE Pelton Water Wheel Co. has orders from Ainsworth, B. C., Sydney, N. S. W., and the City of Mexico, the latter to develop 700 H. P. under a head of 1000 feet for an electric transmission plant.

THE Justinian Caire Company has been incorporated. The directors are: Arthur J. Caire, Fred F. Caire, Delphiue A. Caire, Justinian Caire and Anglae Caire. The capital stock is $200,000, all subscribed.

THE Baldwin Locomotive Works, of Philadelphia, has a contract from the Russian government for forty locomotives. All the engines are to be Vauclain compounds, twenty heing for passenger service and the other twenty for freight service.

THE Gates Iron Works, of Chicago, has just shipped fifteen carloads of machinery to South Africa. The shipment includes three large Corliss engiues, one of which is for hoisting, nne for pumping and the third for milling purposes; also several rock and ore crushers.

THE Krogh Manufacturing Co. has a contract for a Sutter island reclamation plant which comprises a 160 H. P. triple expansion engine, boilers and pump. A pump of 600,000 gallons hourly capacity is being made for a Salinas river, Monterey Co., irrigating enterprise.

THE Fulton Engineering and Shipbuilding Works has sent to the Brunswick mine, Nevada county, the two air compressors they recently built for that mine. They are similar in general construction to those previously described which were placed in the North Star mine.

AMONG recent sales made hy the Parke & Lacy Co. are machinery for the California Furniture Company's factory, a pumping and hoisting plant for the Gold Bar Consolidated Co., Plumas Co., a pumping plant for a reclamation project at Willows, and a cableway for a Honolulu sugar plantation.

THE Dow Steam Pump Works this week shipped to the North Star Mining Co. the large sinking plant described in the issue of Aug. 24, '95. It is over twenty-one feet in length and weighs 15,000 pounds. The company has completed six pumps for Government vessels at Port Townsend, Wash.

THE four wheels for the plant of the Niagara Falls Hydraulic Power and Manufacturing Co. are being built by James Leffel & Co. of Springfield, Ohio, under general plans and specifications made by W. C. Johnson, the engineer. Three of these turhines are specified to generate each 1700-horse power under a head of 205 feet, which is the minimum head estimated as obtainable and to run at a speed of 250 revolutions per minute. As tbe ordinary head will be from 210 to 215 feet, the power of these wheels will he from 1800 to 2000-horse power each. The turhines are mounted on horizontal shafts of the double-discharge design, are fitted with runners seventy-four inches in diameter, made of bronze metal, fitted with balanced gates, and are so designed that the wheel runners are balanced, due to the equal discharge of water on each side, thus doiug away with all end-thrusts on the shafts.

Personal.

JIM WARDNER is at Angels, Cal.

W. C. RALSTON has returned from Carson Hill.

A. B. PAUL has returned from a trip to Shasta county.

C. H. LINDLEY has returned from a professional visit to Redding.

T. G. E. WOLLEB is investigating mining property in New Mexico.

GEO. BROWN is superintendent of the Copper Queen mine at Cooney, N. M.

C. D. LANE is examining Riverside county mines, with a view to purchase.

J. T. BOLLS is superintendent of the mine and mill at Riverdale, Union Co., Or.

D. A. MCDONALD has taken charge of the Pactolian mine, Hurleton, Butte county.

J. W. COOK is superintending operations at the Bohemia, Oregon, G. M. & M. Co.'s properties.

W. J. COLEMAN succeeds Mr. Rodda as superintendent of the Banner mine, Butte county.

HERBERT TYLER has assumed the management of the Falcon mill, near Murphys, Calaveras Co.

SAM GODBE, who bas been visiting his Pure Quill mine in Calaveras Co., has returned to Salt Lake.

HUGH MCDONNELL has an option nn the Potter quartz property, Pittsburg district, Shasta Co.

E. T. PERKINS, JR., of the Idaho Geological Survey, left here this week for New York, via Panama.

JNO. F. KIDDER, State Debris Commissioner, is reported seriously ill at his home in Grass Valley.

EDW. HALSE, late of Mexico, has gone tn Coolgardie, West Australia, representing James Bros. of London.

J. B. FARISH of Denver is here. He will examine the Opportunity and Snake mines at Hillsboro, New Mexico.

J. V. KEELEY, a prominent mine owner of Keystone, Nev., and delegate to the Mexican Exposition, is in the city.

JARED ROUNDY succeeds the late Dennis Sullivan in the foremanship of the Bullion-Beck mine at Eureka, Utah.

W. H. CLARKE, recently of Pittsburg, has assumed charge of the Pennsylvania Oil Company's Works at Natrona, Wyoming.

ALEX HILL, formerly of the Rio Tonto, is general manager of the Mountain Mining Company's property at Keswick, Shasta Co., Cal.

W. H. SHARP, president of the Golden Star Mining Co., Downieville, Sierra county, went to London this week to confer with the company.

N. H. FOSTER, late auditor of the motive power aud machinery department of the S. P. Co., has heen made assistant to Manager J. A. Fillmore.

R. PAINE, an English mining engineer, is visiting the Alaska mine in Sierra Co., which was recently reported sold and $10,000 of the purchase price paid.

R. S. MOORE AND JAS. SPROULE have heen appointed hy the Manufacturers' and Producers' Association as delegates to the Trans-Mississippi Congress.

H. H. MILLER, formerly connected with the Rosario mine, Honduras, returns to that country as superintendent nf the Montserratte Con. M. Co. at Yuscatan.

E. P. RIPLEY, present third vice-president of the Chicago, Milwaukee and St. Paul, will next week he elected president of the Atchison, Topeka and Santa Fe Railroad Co.

GEN. JNO. EATON, of international fame, is in Salt Lake, Utah, where he talks of founding a great college in which shall be taught mining and electrical engineering and other sciences.

W. J. WHITCOMB of Placer has heen appointed receiver of the Cherokee hydraulic mine, Butte Co. This is the latest move in the sensational and long-continued litigation in which effort is heing made to regain and retain control of one of California's famous gold producers.

J. H. MCCONNELL, superintendent of motive power of the Union Pacific, says that for the last three winters he has heen heating trains of seven or eight cars with the exhaust steam from the locomotive air pump, and that this method is used exclusively with the exception of a few days of very cold or windy weather.

Coast Industrial Notes.

—The Atlantic and Pacific R. R. Co. will shortly place an order for 2000 freight cars.

—Nearly 400 men are now reported at work on the new railroad from Portland to Astoria, Oregon.

—The Marysville Gas Co. has reincorporated as the Marysville Gas and Electric Co.; capital stock, $500,000; paid up, $100,000.

—The wool product of Oregon, Washington and Idaho is over 30,000,000 pounds this year. Free trade has helped cut the price down to 6 cents.

—The Suisun Trustees have planned to build a water-works plant to cost $40,000 by the issuance of forty-year honds, hearing six per cent interest.

—There are about 175 employes of the United States mint in this city, 42 being women and girls. The present weekly gold receipts are increasing.

—The Pacific Paving Company of San Francisco bas incorporated. Incorporators—J. H. Swift, J. Rice, I. L. Thurher, F. N. Neuval and J. T. Wilson; capital stock, $300,000, all paid up.

—At a recent auction sale of horses from the Chino ranch the prices ranged from $2 to $17.50, and some of the horses sold were ones which a few years ago would have been in demand at $100.

—After December 1st the Southern Pacific Company will refuse to handle cars that are not equipped with grab irons, according to law, and after February 15th will refuse cars on which the draw hars are not at the standard beight.

—The first petroleum refinery in the State will he built at Puerto, between Los Angeles and Pomona. Two Standard Oil representatives have been there for the last sixty days, and twelve carloads of material for the building have arrived nn the ground.

—The Sacramento Electric Power and Light Company has incorporated; capital stock, $1,500,000; $16,000 subscribed. Directors—Albert Gallatin of San Francisco and Andrew J. Ralston, Horatio P. Livermore, Charles Livermore and Joshua Barker of Oakland.

—The California Northern Land Company has been incorporated here "to do everything and every business that a natural person can do:" capital stock, $300,000: $81,000 subscribed: directors—E. Rochart, J. T. F. Schlingman, S. Wangenheim, S. Newman, J. Newman.

—The Washington Coal and Timber Company has incorporated here to buy and sell real estate, timber land, mining property, etc.; capital stock, $1,000,000; $570.000 subscribed; directors, W. E. Stevins, M. Wunch, J. Cashin, J. Kavanagh, T. Campbell, D. M. Cashin and M. Campbell.

—For the first nine months of '95 the rail shipments from Washington hy the Great Northern, Northern Pacific and Canadian Pacific roads were 65,634,000 feet of lumber and 1,668,264,000 shingles. For the same time in '94 there were shipped 49,632,000 feet of lumber and 1,443,200,000 shingles.

—The California and Nevada Meat Company has organized in Oakland; capital stock, $100,000, all subscribed hy the following directors: F. H. Brooks, $33,000; F. Hostetter, $33,300; A. C. Henry, $33,200; A. Cook, $100; W. H. Henry, $100. A. C. Henry has extensive cattle ranges in the northern part of the State of California.

—The rate war between the S. P. Co. and the O. R. & N. Co. results in a steerage rate of $2.50 from here to Portland, Or., over 600 miles by the steamship company, and a through railroad rate of $5 to tbe same point by the railroad company. The Southern Pacific has cut its rates on oat shipments in carloads from Oregon to San Francisco from $6 a ton to $3. The Navigation Company has cut the rate from $3 to $2.50 a ton.

—The Central Lumber Co. is the name of the new trust comprising nearly every lumber mill and wholesale dealer of any importance on the coast. The combine proposes to control every foot of lumber entering San Francisco by water. The concerns that don't join are to be "frozen out." E. J. Holt is president and D. H. Bibb secretary. The proposition may he temporarily successful, but is sure to go to pieces after a while.

—The attention of the railway world is at present attracted to the wonderful speed attained by transcontinental railway trains. When the rate is considered, crossing deserts and climbing three mountain ranges, it is worthy of universal note that the distance from here to Chicago, 2357 miles, can be made in tbree days, and the distance from here to New Orleans, 2489 miles, in 75 hours.

—Aggregate value of real estate in California in '95, $690,542,325; improvements, $241,994,060; personal property, $157,726,988; total value of property, $1,090,263,373; value of railroads, $43,018,640; total value of all property, $1,133,282,013. These are assessors' figures and could be multiplied by three in an estimate of true values. The original assessed value of mortgages is $195,279,838; the funded debt, $5,140,887, and the floating debt, $147,725, making the total of county indebtedness, $5,288,612.

—During '93 and '94 the Pacific Mutual Life Insurance Co. received premiums upon California business amounting to $501,800.50, and paid during the same time for taxes upon California property $39,378.75. During the same period the twenty-eight life and accident insurance companies organized elsewhere collected premiums upon California business to the amount of $8,180,208 24, and paid in California property taxes less than $6000. The California company, securing less than 7 per cent of the business, paid 87 per cent of the taxes. Since June 1, '93, besides paying claims under its policies to the amount of $793,827, it has invested upon the Pacific coast, chiefly in California, a total of $1,384,254.96.

—The Geographical Society of the Pacific held their November meeting on Wednesday evening last at Y. M. C. A. Hall, the subject heing "Drainage of the Valley of Mexico," hy E. J. Molera, C. E., with camera illustrations. Among the pictures thrown on the screen were several old Spanish maps of the valley, one coming down from the time of Cortez, showing the extent of the lake which surrounded the city, and the bridges over which the Spanish troops fought tbeir way in the desperate struggle for the capital. The lecturer gave an interesting account of the engineering work done hy the Mexican Government in drawing off the water from the lakes and marshes and tbe resulting improvement in the sanitary condition of the city. Typhoid fever was formerly widespread among natives, as well as foreigners. The disease has now greatly abated. Some beautiful landscapes in the valley were exhibited and a fine one of snow-clad Popocatepetl, "the giant mountain."

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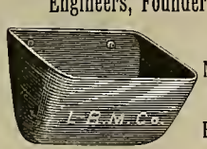
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References:
Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.
Edward M. Preston, President Citizens' Bank of Nevada City, California.

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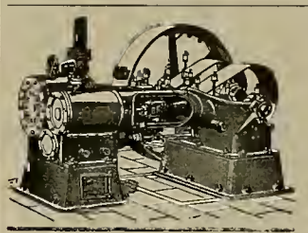
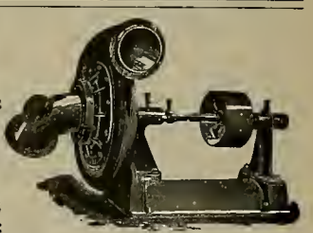

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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR WEEK ENDING NOV. 12, 1895.

549,704.—RAILWAY CONSTRUCTION—J. Clark, S. F.
549,668.—AMALGAMATOR—F. L. Fisher, Granges, Or.
549,785.—STAMP FRAME—I. B. Hammond, Portland, Or.
549,602.—ROTARY ENGINE—I. Harding, San Jose, Cal.
549,639.—BOOK HOLDER—C. P. Harris, S. F.
549,671—BEET TOPPER—A. Hunter, S. F.
549,725.—CAN BLANK CUTTER—A. Johnson, S. F.
549 650.—STAMP AFFIXER—J. J. McDade, S. F.
549,679.—PETROLEUM BURNER—J. J. Montgomery, Oakland, Cal.
549,812.—GRINDING MILL—J. J. Newsom, Oakland, Cal.
549,682.—TREE PLANTER—I. Panama, San Salvador.
549,658.—DREDGING APPARATUS — W. B. Pless, Stockton, Cal.
549,830.—MINING APPARATUS—H. W. and W. W. Smith, Portland, Or.
549,618.—OFFICE DIRECTORY—D. Waide, S. F.
24,898.—DESIGN WALL PAPER—A. W. Oakey, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CAR FENDER.—James O'Donnell, San Francisco, Cal. No. 548,815. Dated Oct. 29, 1895. This fender consists essentially in a shield having a normal tendency to fold, whereby it is adapted to embrace the obstructing body; means for holding said shield expanded and open when not in use, and means which are best controlled by contact with the obstructing body for tripping said shield and allowing it to fold. The object of this is to provide a safety guard for cars, which will secure against accident by reason of immediately grasping and sustaining the obstructing body and preventing it from being knocked down or falling after being struck.

WATER PURIFIER AND OIL EXTRACTER FOR ICE MACHINES.—Richard F. Schroeder, Sacramento, Cal. No. 549,295. Dated Nov. 5, 1895. This invention relates to an apparatus for purifying water to be used in ice machines, and especially for extracting the oil from the water produced by the condensation of the exhaust steam from the engines so that this water can afterwards be employed in the manufacture of ice. It consists essentially of a plurality of chambers or vessels, each of which is provided with a series of overflow perforations formed in its walls just below the upper edge, a supply pipe leading to the lower portion of the initial chamber or vessel having an upwardly extending overflow pipe terminating at its upper end near the line of overflow perforations therein, a pipe from the initial chamber or vessel leading into the next chamber and terminating at its upper end contiguous to the overflow perforations therein, and a heating coil in said passage adapted to reheat the water to expel the absorbed air and assist in raising the oil to the surface, and a discharge from the second chamber or vessel for the purified water.

JOINT AND BEARING.—W. C. Rarig, San Francisco, Cal. No. 549,294. Dated Nov. 11, 1895. The object of this invention is to provide an improved means for securing the removable bushings which are employed in a joint to preserve the main parts of the joint from wear. These means for securing prevents the bushing from being loosened on the pin by the movement of the parts or by other causes. It consists of a pin projecting from a frame adapted to fit within a corresponding hole in the connecting part, a sleeve fitting the pin immovably and having its exterior surface movable within the hole in the connecting part of the joint, the inner end of the sleeve being inclined with the axis of the pin fitting against the corresponding inclined surface of the arm and a lock whereby the sleeve and pin are united together.

FISHING ROD.—Charles Kewell, San Francisco, Cal. No. 549,292. Dated Nov. 11, 1895. This invention relates to an improvement in fishing rods whereby an enlarged grip portion is provided. It consists of solid rod sections and the reel section and an intermediate enlarged grip portion made hollow and provided with slots or perforations.

NAILING MACHINE.—Samuel Wilde, Woodland, Cal., assignor of one-half to R. A. Bourne, San Francisco, Cal. No. 549,301. Dated Nov. 5, 1895. This device belongs to that class of nailing machines in which the nails are fed from a suitable source of supply through directing channels to a holder lying immediately above the work, and into which a plunger descends, whereby the nail is driven through the holder and into the work. The invention, although applicable in most of its features to the general class of nailing machines, is especially intended as a shoe nailing machine, by reason of the peculiar support for the work and the provision of independent supply hoppers for different sized nails. The part of the machine which embraces the highest novelty is the supply hopper, which is composed of an upper and lower compartment, each having inclined bottoms, the upper compartment having the slot narrower than the diameter of the nail head, and an enlargement therein through which said head can pass, and the bottom of the lower compartment having a central groove, the top of which is narrower than the diameter of the nail head and is provided with an enlargement through which said head can pass, and the end of the groove having an opening through which the nail is discharged. The hopper is shaken by suitable means, thereby causing the nails to seek and to hang in the slot and groove successively and to pass through their enlargements. Suitable channels lead the nails down to the holder and the plunger descends to drive the nail home.

COMBINED PUMP AND SADDLE-POST FOR BICYCLES.—Horace Blackman and Henry Cone of San Francisco, Cal. No. 549,308. Dated Nov. 5, 1895. This invention consists in a removable saddle-post so constructed as to serve the additional function of an air pump for inflating the pneumatic tires of a bicycle. The object of the invention is to provide a simple and serviceable pump for inflating the tires, said pump being so constructed, arranged and located as to dispense with the necessity of carrying a separate pump, as is usually done, which result is arrived at by making the saddle-post serve the double function of a saddle-post and a pump. Another object of the invention is to provide such a construction of pump as will adapt any tubular portion of or attachment to the machine for use as the cylinder of the pump, and by the extension thereof to provide a reservoir or receptacle for a repair kit.

PETROLEUM BURNER.—John J. Montgomery, Oakland, Cal. No. 549,679. Dated Nov. 12, 1895. This burner consists essentially in a chamber to which the petroleum is fed, and in which it is ignited. said chamber being closed behind the plane of the oil feed, whereby all direct draft in the line of flame exit is cut off, said chamber having one or more controllable air inlets at a point or points in advance of the plane of the oil feed, whereby flame rotations are formed and the flame retarded to effect more perfect combustion of the petroleum.

TREE PLANTER.—Ignacio Panama, Santa Ana, San Salvador. No. 549,682. Dated Nov. 12, 1895. This invention relates to the general class of machines for making holes in the ground, which, from the use that they are generally applied to, are called tree planters, though often used for digging post holes and other similar work. The invention consists in a novel connection for operating the auger or digging implement by power derived from a suitable portable engine mounted on a wheeled frame. The object of the invention is to increase the speed, power and general efficiency of the machine.

ROTARY STAMPING AND GRINDING MILL.—John J. Newsom, Oakland, Cal., assignor of three-fourths to Thomas R. Bassett and Thomas D. Newsom of same place. No. 549,812. Dated Nov. 12, 1895. This device belongs to that class of crushing mills in which a roller is rotated within a mortar. The invention consists essentially in a rotating cam roller carried by a hinged frame which supports it clear of the material in the mortar between the successive actions of its cam, thereby allowing it to acquire momentum for successive blows and grindings, said frame by its drop and rise permitting successive stamping and grinding effects of the cam and enabling said cam to pass over unyielding and obstructing material. The object of the invention is to provide a crushing mill in which the roller, by reason of its cam shape and the manner in which it is mounted, shall have both a stamping and grinding action, whereby the material is effectually crushed and pulverized.

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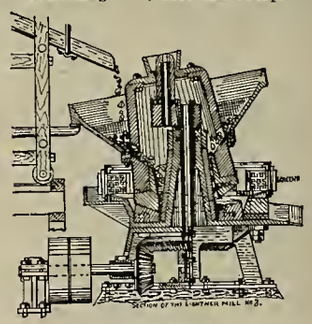
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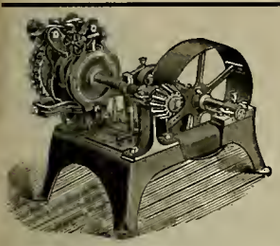
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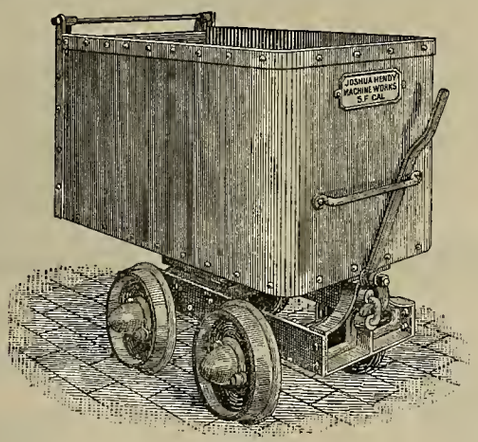
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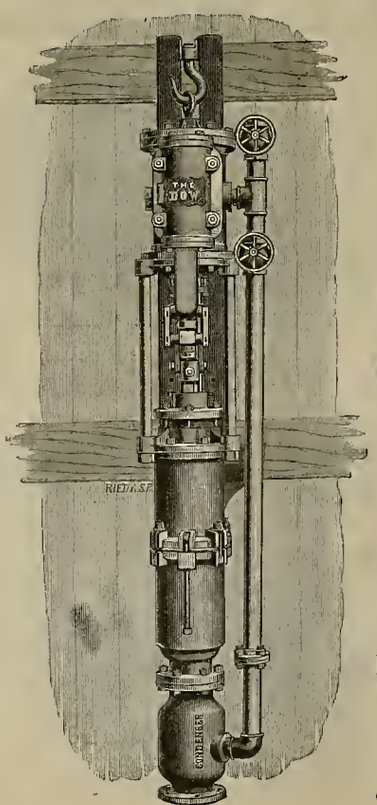
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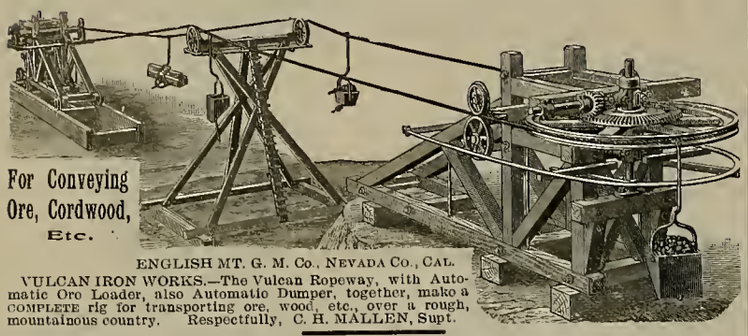
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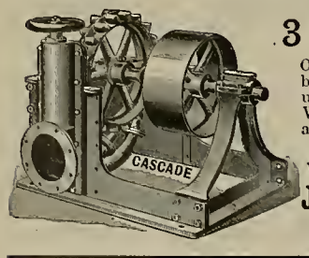
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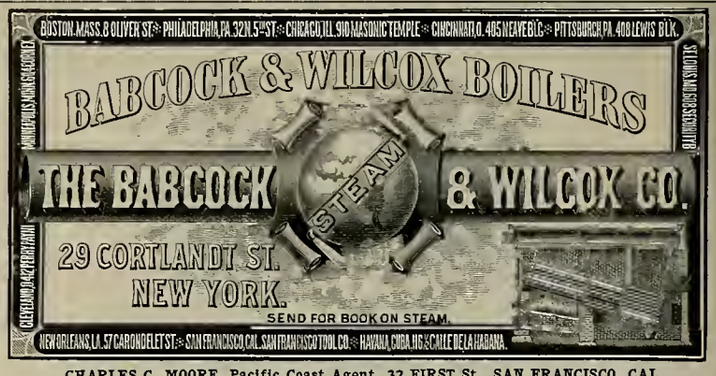
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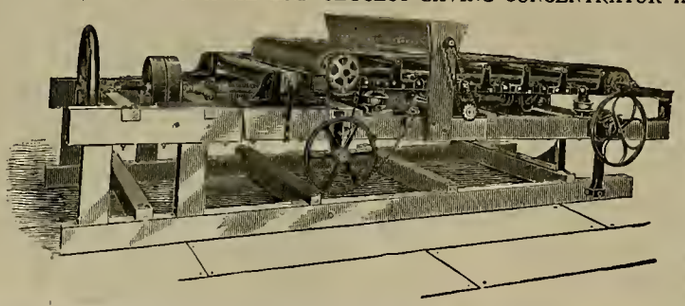
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Market Reports.

The Markets.

SAN FRANCISCO, Nov. 21, 1895.

Silver sunk during the week to 67: copper is not advancing: the other metals are quoted a shade lower all through. Returns collected hy the *Iron Age* show that the rate of production of pig iron has reached the enormous total of 217,308 tons per week on Nov. 1. The Octoher production is estimated at 915,346 tons, as contrasted with 763,335 tons in July. The American *Manufacturer* says: "The present dullness is suspicious. Consumers know what iron, hillets, hars and plates cost, and everyhody knows just ahout what decline is possihle under a dull market. But it is a fact within the knowledge of all whose husiness it is to he posted, that there are large requirements to he filled, though it is to he questioned whether a production in excess of 200,000 tons per week of pig iron is not dangerous to the hest interests of the producers of that output. There are plans laid awaiting contingencies that may or may not happen, that may ahsorh every ton of iron made at the present enormous rate."

Copper was quoted at £43 17s 6d in London on the 9th inst. One year ago the figure was 40s 15d.

Silver shipments from England to the Orient for the first ten months of '95 were as follows:

To India	£2,968,980
To China	1,580,610
To the Straits	668,753
Total	£5,218,343
In 1894	£7,856,408

Shipments of gold last week aggregated $3,267,600. It is believed that an intermittent outward movement of the precious metal will now occur. Treasury officials admit that all present indications point to a further export of gold for some weeks, hut profess to helieve that the volume will he limited to the amounts necessary to cover the deficiency in the supply of commercial hills, which at present is light. They expect that the amount of gold to go out will be comparatively light until after the Christmas holidays. What will happen afterward they do not care to discuss.

The gist of the matter is very simple. The American people owe money in Europe on account of these dehts. Our exports of merchandise are duly credited. If, however, these exports are insufficient in value to meet the requirements, gold must he sent in settlement of the halance. The Octoher statement of our foreign trade shows that while our exports increased to a small extent, our imports of merchandise were greatly swelled, the result that the halance of trade in our favor, which in Octoher, 1894, was $23,633,135 in this year $11,960,938. For the six months ending Octoher 31, 1895, the excess of imports over exports was $31,119,749, as compared with an excess of exports over imports in the corresponding period of 1894 of $96,661,369. It is therefore not surprising that gold goes out.

The aggregate money circulation of the country Nov. 1 was $1,598,859,316, against $1,672,093,422 one year and $1,585,593,509 one month hefore. The increases in Octoher were $5,297,531 in gold, $3,207,565 in standard silver dollars, $2,423,216 in suhsidiary silver, $3,021,-399 in silver certificates, $7,491,243 in Treasury notes, and $530,869 in National Bank notes. The decreases were $227,880 in gold certificates, $1,378,136 in legal tenders and $7,100,000 in currency certificates.

A coal circular says: "The recent liheral arrivals, combined with 34,100 tons of Swansea coal which arrived since Nov. 1, have overloaded the market, as the amount at hand is equal to ahout twice the amount consumed since the ahove arrived. As seven-eights of this was sold prior to arrival, the market price has not heen seriously disturhed, although any cargo coming to hand unsold will have to be disposed of at a loss, as all our large consumers and our principal wholesale dealers are pressed for storage room. As Swansea shipments are admitted free of duty they are sold at a shade helow Australian, hence are getting a very strong foothold here, where Wallsend was formerly consumed.

New York Metal Market.

NEW YORK, Nov. 21.—PIG IRON—Southern, 12@14.50; Northern, 12@14.00.

COPPER — Brokers', 11½c; exchange, 11.30c.

LEAD—Brokers', $3.10; exchange, $3.22½.

TIN—Straits, 11.50@11.60c.

SPELTER—Domestic, $3.75.

New York Silver Prices.

NEW YORK, Nov. 21.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30¾	67⅜	11 50	.....
Saturday	30¾	67⅜	11 35	3 10
Monday	30¾	67¼	.....	3 15
Tuesday	30⅜	67⅛	.....	.....
Wednesday	30¼	67	11 40	$ 3 15
Thursday	30	67	.....	.....

The local hullion, mouey and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.88
London Merchants	$4.86½
London Sight Bankers	$4.89½
Refined Silver, per oz., 1000 fine	67c
Mexican Dollars	55c

San Francisco Metal Market.

COPPER.

Bolt	¼ & 5-16, 20c;	⅜ and larger,	21c
Lake Superior Sheathing	22	@	—
Ingot, jobbing	—	@	18
Ingot, wholesale	17	@	18
Sheet copper	—	@	21

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Alpha Con, Nev	15	10c	Sept 30,	Nov 5, Nov 28	C E Elliott, 79 Nevada Block
Best & Belcher M Co, Nev	59	25c	Nov 4,	Dec 9, Dec 30	M Jaffe, 309 Montgomery
Bullion M Co, Nev	46	10c	Nov 4,	Dec 9, Dec 30	R R Grayson, 331 Pine
Bulwer Con M Co, Cal	11	5c	Oct 29,	Dec 4, Dec 31	C E Elliot, 309 Montgomery
Confidence M Co, Nev	26	30c	Nov 13,	Dec 18, Jan 8	A S Groth, 414 California
Chollar M Co, Nev	41	25c	Nov 12,	Dec 17, Jan 7	C E Elliot, 309 Montgomery
Exchequer M Co, Nev	38	5c	Oct 21,	Nov 25, Dec 19	C E Elliot, 309 Montgomery
Gold Bar Con M Co, Cal	2	3c	Nov 5,	Dec 21, Jan 16	E C Godfrey, Crocker Building
Gould & Curry S M Co, Nev	77	15c	Nov 5,	Dec 10, Dec 30	A K Durbrow, 309 Montgomery
Iowa Mining Co, Nev	21	5c	Oct 23,	Nov 26, Dec 16	R L Thomas, 419 California
Jamison M Co, Cal	7	25	Nov 9,	Dec 14, Jan 6	S W Cheyney, 120 Sutter
Marguerite M Co, Cal	1	10c	Nov 2,	Dec 2, Jan 5	Chas. Winters, 237 12th St., S F
Mexican M Co, Nev	53	25c	Nov 19,	Dec 23, Jan 14	C E Elliot, 309 Montgomery
Ophir S M Co, Nev	67	25c	Nov 5,	Dec 9, Dec 30	E B Holmes, 309 Montgomery
Occidental Con M Co, Nev	20	10c	Oct 1,	Nov 14, Nov 25	Alfred K Durbrow, 69 Nevada Blo k
Superior M & M Co, Cal	1	5c	Nov 5,	Dec 9, Dec 30	J Howard Barnard, 916 Market, S F
Yellow Jacket M Co, Nev	60	25c	Nov 12,	Dec 17, Jan 22	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date
Mexican M Co, Nev	C E Elliot, 309 Montgomery	Dec 3

ZINC.

Sheet	9½@		

LEAD.

Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Chilled, do, "		"	1 45

IRON.

American Soft	16 00	@	18 00
Pig, per ton	18 00	@	20 00

STEEL.

English, lb	16	@	19

ANTIMONY.

Per lb	—	@	10½

PIG TIN.

Per lb	15	@	16 00

QUICKSILVER.

Home trade, per flask	39 00	@	40 —

BORAX.

Refined, in car lots	—	@	5½
Refined, in sacks and barrels	—	@	5¾
Powdered, in car lots	--	@	5¾
Concentrated, "	—	@	4¾

TIN PLATE.

Per bx	5 25	@	6 00

ZINC.

Sheet	8½@		

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00		
Greta	7 50		
Nanaimo	7 00		
Gilman	6 50		
Seattle	6 00		
Coos Bay	5 00		
Cannel	9 50		
Egg, hard	12 50		
Wallsend	7 50		
Scotch Splint	7 50		
Brymbo	7 50		

TO ARRIVE—CARGO LOTS.

Australian	5 50	@	— —
Liverpool Steam	6 00	@	— —
Scotch Splint	6 50	@	— —
Cardiff	6 50	@	— —
Lehigh Lump	9 00	@	— —
Cumberland	8 50	@	— —
Egg, hard	10 00	@	— —
West Hartley	7 00	@	— —

COKE.

Gas Companies'	75c	₱	bbl.
English, to load	9 00	@	10 00
" spot, in hulk	— —	@	13 00
" in sacks	— —	@	15 00
Cumberland	9 00	@	— —

NAILS.

Wire			$3 50
Cut			3 25

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, November 21, 1895.

The market had another setback the past week. The decline was predicted hy this paper, but prices have not yet touched the lowest figures looked for by those said to he connected with the inside. It is contended that the manipulation is all in this line so as to uncover every share on a margin, and also to freeze out hy assessments shares held by cash huyers. It seems as if there are no moneyed men disposed to promote a deal, owing, as report says, to the Hale & Norcross still heing in court, and a desire on their part to know where they stand.

The news from the Comstock mines continues of the most favorahle character, and as worked is pushed, expert mining men hecome more convinced that there are good grounds for the helief that ore development will he made within the next twelve months which will cause, even without money hacking, shares in several mines to sell for considerahly higher prices than they command at present. Of necessity, this view is hased on the theory that the mines will he worked in the interest of shareholders and not in that of mining share manipulators. From the Alta group reliable information is at hand which is of the most encouraging character. This is also indicated hy official letters.

In the Gold Hill group the work under way is of a procrastinating character; yet this same work is putting the mines into hetter condition for expeditious working and to extracting of ore when the powers that he have frozen all outsiders out of their holdings through assessments. The work made puhlic is to the west, where it has been found there is a ledge of gold hearing ore. In Overman, Seg. Belcher, Belcher, Crown Point, Kentuck, Yellow Jacket, Confidence, Challenge, Con. Imperial and Alpha, the work under way seems to he done for the purpose of developing the west lode. In ahout all of them it has heen found that enough ore has been found to justify putting them in condition for better and more expeditious working later on. In Alpha the ore is reported at around $20, but there is higher grade ore in that mine farther to the west. Con. Imperial will soon he in ore, if they are not already in it. In Gould and Curry, and also Bullion, the west drift is still heing run so as to tap the west lode. Bullion will drain it at a considerable depth helow present workings. In Best & Belcher the work is largely of a dead character, yet it lays the foundation for more important work later on. In Con. Virginia the work under way deserves close watching. It is stated that Mr. Mackay gave instructions for certain work in that mine and two or three of the others reported to he controlled hy him, which he helieves will eventuate in finding something very good. A large number of mining men have great confidence in his judgment and think that the work will develop a large hody of ore. In this mine, Ophir and Mexican work is being done on several levels. Of course this costs money, yet the end, it is said, justifies the expenditure. In Union and Sierra Nevada the work, while not attracting attention, deserves close watching, for it is in the right direction, and if not stopped or turned aside will make itself felt before the close of 1896.

Interest is beginning to center on the Brunswick lode. The work there is in an advanced state. It now admits of running crosscrifts for the lode. When they strike it parallel drifts and crosscutting will he the order. From the general nature of the work it should not cause surprise if a deal is in contemplation in the shares of the mines owning ground on that lode, but how prices will he sent it is hard to say. After the lode is struck it will take time and money to develop it.

From the Bodie district the work is unimportant. While enough ore can he and will he found through the present workings, yet it is morally certain that the management will have to go lower, several hundred feet, hefore the hest results can be secured for shareholders. Miners in that district look for a revival there the coming year.

The following illustrates the changes of the week:

Mines.	Nov. 14.	Nov. 21.
Alpha	$ 35	$ 27
Alta Consolidated	12	09
Andes	29	.....
Belcher	30	26
Best & Belcher	71	54
Bodie	39	34
Bullion	10	05
Challenge	36	25
Chollar	25	.....
Confidence	1 10	80
Consolidated California and Virginia	2 50	2 10
Consolidated New York	.....	.....
Crown Point	28	.....
Exchequer	.....	.....
Gould & Curry	33	25
Hale & Norcross	1 35	1 20
Justice	05	.....
Mexican	52	37
Ophir	1 30	1 10
Overman	13	09
Potosi	52	44
Savage	41	32
Sierra Nevada	78	57
Union	62	45
Utah	05	.....
Yellow Jacket	26	21

San Francisco Stock Board Sales.

SAN FRANCISCO, Nov. 21, 1895.

9:30 A. M. SESSION.

100 Alpha	27	100	1 15
100 Alta	09	100 Mexican	36
300 Belcher	26	200	35
100 Best & Belcher	54	200 Occidental	16
150 Bodie	34	650 Ophir	1 05
100 Challenge	24	200 Overman	09
550 C. C. & Va	2 10	200 Sierra Nevada	56
100 Gould & Curry	24	200 Union	45
200 Hale & Norcross	1 20		

SECOND SESSION—2:30 P. M.

500 Opbir	1 10	150	20
500 Mexican	37	2000 Con Imperial	02
200 Gould & Curry	24	100 Belcher	26
100	25	250 Confidence	80
300 Con Cal & Va	2 05	500 Bullion	05
200 Savage	32	200 S B & M	07
250	31	300 Union	45
100 Potosi	44	200 Challenge	25
400 H. & N	1 15	500 Occidental	23
100 Yellow Jacket	21	200 Bodie	33

A Free Milling Gold Property for Sale.

The Mammon mines, with milling records that settle the question of doubt, fully developed for a successful enterprise, with all machinery, mill, buildings new, immense water supply, maps and mining engineers' report, clear title, and fully explained why these mines are sold. The investment positively safe and the chance of a lifetime for a small capital to acquire a fortune. Correspondence solicited that means business forthwith.

CHARLES F. KUHNEN.
Casa Grande, A. T.

Assessment Notices.

BULLION MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of November, 1895, an assessment (No. 46) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 20, No 331 Pine street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office—Room 20, No. 331 Pine street, San Francisco, California.

SUPERIOR MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Placerville, El Dorado county, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the fifth day of November, 1895, an assessment (No. 1) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 916 Market street, Room 81, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. HOWARD BARNARD, Secretary.

Office—Room 81, 916 Market street, San Francisco, California.

MARGUERITE GOLD MINING AND MILLING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Auburn, Placer county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the second day of November, 1895, an assessment (No. 1) of 10 cents per share was levied upon the whole of the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, 237 Twelfth street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second day of December, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on MONDAY, the fifth day of January, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

CHAS. WINTERS, Secretary.

Office—237 Twelfth street, San Francisco, California. Office hours from 4 to 6 o'clock P. M. Bring your certificate.

THE JAMISON MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, on Jamison Creek, near Johnsville, Plumas County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the ninth day of November, 1895, an assessment (No. 7) of two cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 120 Sutter street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of December, 1895, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on MONDAY, the 6th day of January, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

SAM W. CHEYNEY, Secretary.

Office—Room 50, 120 Sutter street, San Francisco, California.

GOLD BAR CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1895, an assessment (No. 2), of three cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Rooms 37 and 38, Crocker Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of December, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on THURSDAY, the 16th day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. C. GODFREY, Secretary.

Office—37 and 38 Crocker Building, San Francisco, California.

IOWA MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia City, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the 23d day of October, 1895, an assessment (No. 21) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 2, No. 419 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 26th day of November, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on MONDAY, the 16th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

R. L. THOMAS, Secretary.

Office—Room 2, 419 California street, San Francisco, California.

GOULD & CURRY SILVER MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1895, an assessment (No. 77) of Fifteen (15) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of December, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

WANTED.—POSITION AS ASSAYER OR Amalgamator. Capable to take charge of mine and mill. Over 25 years experience.

C. S. A., 1212 So. O Street, Tacoma, Wash.

Assessment Notices.

BEST & BELCHER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the fourth (4th) day of November, 1895, an assessment (No. 53) of twenty-five cents (25 cents) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the ninth (9th) day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

M. JAFFE, Secretary.

Office—Room 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

CONFIDENCE SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 13th day of November, 1895, an assessment (No. 26) of 50 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, No. 414 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of December, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on WEDNESDAY, the 8th day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

A. S. GROTH, Secretary.

Office—No. 414 California street, San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	499	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4,000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on November 2, 1895, the above sale is postponed to MONDAY, the 2d day of December, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

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FIRST: There Is Saved by the Use of This Mill a Large Bill for Heavy Timbers, In Many Instances Obtained at Great Expense and Loss Of Time.

SECOND: The Saving in Mill-Wright and Mechanics' Labor in Framing and Erecting.

THIRD: The Large Amount of Space Saved.

We refer by permission to Mr. N. A. McMillan, Haines, Oregon, manager of the Blue Mountain Mining Co., at Rock Creek, Or., where ten of our stamp mills are in operation; also to Mr. John S. Miller, Helena, Montana, manager of the Diamond Hill Mining Co., operating one of our forty-stamp mills at their mines at Townsend, Montana.

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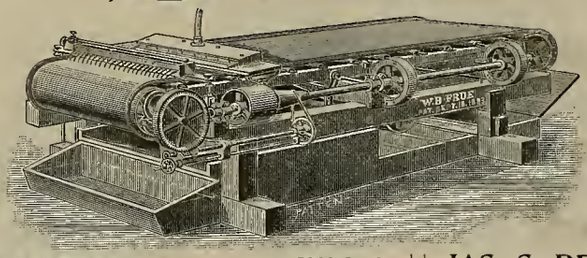
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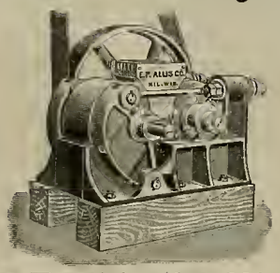
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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 22.

SAN FRANCISCO, SATURDAY, NOVEMBER 30, 1895.

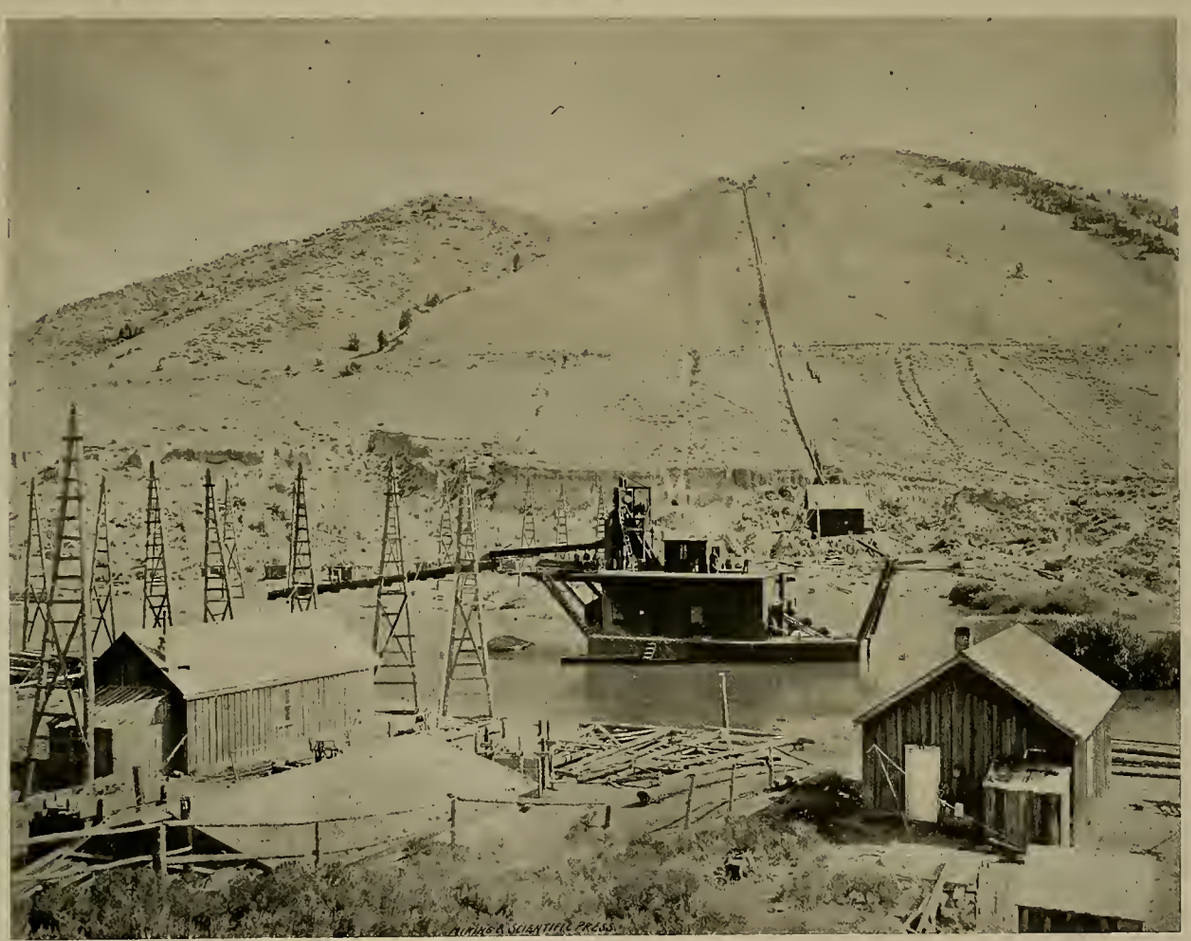
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Handling Refractory Placer Ground.

Before undertaking a placer proposition of any description there are two essential quantities to be taken into consideration. The first applies only to the approximate value of the ground; the second is how to handle the gravel. Herewith is presented some practical results regarding the operations of the Gold Dredging Co.'s plant at Bannack, Montana, embodying what is believed to be of general interest to many hydraulic miners. The bars on both sides of Grasshopper creek in the vicinity of Bannack have been ground-sluiced, and in some cases hydraulicked, but the actual bed of the river, the locality where the bedrock is lower and consequently holds more gold, had not, until the advent of the Gold Dredging Co., been mined at all, except in a few isolated places, where drifting was the method used. Any one who is conversant with placer mining knows that drifting is the slowest and most expensive way of handling gravel. The Gold Dredging Co. was incorporated in the fall of 1894. H. J. Reiling was elected president, F. L. Champlin vice-president, M. McDonald secretary and L. C. Bonney treasurer, all being residents of Chicago. The superintendent is Rene Curin, who was manager of the Golden Leaf, a placer mine, situated about a quarter of a mile below the Gold Dredging Co.'s ground, where drifting had been used successfully in getting out the gold.

After the first excitement had passed and the old-timers had given up hopes of ever seeing bedrock, Bannack lived on the memories of her past greatness. The numerous small claims gradually became the property of one company, but, although the owners knew they had a bonanza, they could not do anything towards reaping any benefit from their holdings. In the few spots where shafts had been sunk the water had soon stopped all further attempts to explore the pay streak.

The scheme in general consists in dredging the creek. The dirt is elevated at the same time and dumped into sluice boxes. As soon as a pit or channel has been excavated of sufficient size, viz., 500x 300 feet, the boat proceeds up stream and throws up a dam behind it. The water is then pumped out by means of hydraulic jets and the bedrock cleaned up by hand. In handling the top dirt too much attention is not paid to its richness, owing to the fact that the Grasshopper gold is coarse and lies mostly on bedrock. While the bedrock in the first pit is being cleaned the boat is digging another pit up stream.



GOLD DREDGING COMPANY'S PLANT AT BANNACK, MONTANA.

The first work that was commenced was to enlarge a ditch that tapped the creek two and one-half miles above the city. Into this the entire stream was turned, and, with a dry river to work on, it was a matter of a few days to build a dam that would raise the water to the necessary level. Then, again, when the first pit is dug the bulk of the water is turned into the ditch once more to facilitate the pumping out and cleaning up of pit No. 1. The contract for building the boat was let to H. K. McDonald, of Chicago, who had his men there by February, 1895. The boat was finished and launched on May 15th, '95.

The dredger equipment consists of two chains of buckets, viz., the main or excavating buckets, having a capacity of 220 cubic yards per hour, and the elevator buckets that raise the gravel twenty-five feet above the surface of the water, after it has passed through a rotary grizzly having five-inch openings to allow the finer dirt to fall into a hopper, where it is caught by the elevator buckets. Both chains of buckets, together with the rotary grizzly, are operated by an electric motor. The type used is the "L. W. P. 20" Ry. motor. A twelve-inch centrifugal pump is used to supply the necessary water to the sluice boxes. The capacity is six cubic feet per second, and they dig a pit twenty-five feet deep. This is run by a motor of the same type as the bucket motor. The ladder on which the main buckets travel is raised and lowered by a smaller motor, viz., a "G. E. 800" Ry. motor, and by a suitable arrangement of clutches this motor can be made to swing the boat. The anchors are in the form of spuds, made of Oregon fir 18x 18 inches by 40 feet long; they are raised or lowered by a similar motor. All the switches, levers, etc., are placed in the pilot-house, except those that are used to operate the anchors, these being placed on the machinery deck between the two anchors. There are twenty incandescent lamps and one electric searchlight on the boat, and from ten to twenty lights on the sluice boxes, consequently night does not affect the operation. The power is derived from a ditch carrying 200 miner's inches, with a head of 330 feet. In the illustration, from a photograph taken specially to accompany this article, the power-house is seen across the creek from the boat. The pipe line is shown which, although it has a fall of 330 feet, is only 750 feet long. This pipe is eighteen inches in diameter and reduces to a 2 6-10-inch nozzle, the water wheel being of the well-known Pelton type. It is twenty-six inches in diameter, and is directly connected to an Edison generator of 134-horse power capacity.

To govern the speed, which is 650 revolutions per minute, the Pelton differential governor is used. Till recently water power was regarded as a somewhat uncertain quantity in connection with

(Continued on page 357.)

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J. F. HALLORAN.....General Manager

San Francisco, November 30, 1895.

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SECRETARY OF THE INTERIOR SMITH decides that a mineral application properly filed and duly followed by notice thereof by publication and posting is *per se* a segregation of the land covered thereby, and when it is finally sought to relocate said land on the ground of abandonment the relocator should be first required to establish the fact of abandonment, which seems more equitable than some other recent decisions of his.

IN editorial mention, the Sacramento *Record-Union* cruelly says of the *Manufacturers' and Producers' Monthly*, a new publication in this city, that "it is the finest and best example that has fallen under our notice of absolute stupidity and unpardonable ignorance." The only reason for referring to the matter at all is to briefly state that the Manufacturers' and Producers' Association has officially issued a notice disclaiming any connection with any publication of any kind, an action that was certainly due to its own dignity as a commercial body since its inception.

FROM far-off Scottish dales Mr. J. C. Montgomerie writes some ancient and modern history regarding the cyanide process and present patentees. He misses the main point, viz., that the company of which he speaks makes successful claim to first public application of the principle that a weak cyanide solution would have the desired result. 'Twas known ninety years ago that cyanide would dissolve out the gold and silver, but not known outside of the laboratory till five years ago regarding the dilute solution and its applicability to separating the gold, and its selective action thereon. The letter is published in its entirety, less for any special importance attaching to it than because the demonstrated value of the process makes any and all reference to it a matter of universal interest.

WHEN a journal is established with special reference to any trade or industry it is good evidence of permanence, for few men with ability sufficient to intelligently conduct such a concern care to take hold unless it looks profitable. The motor vehicle industry is now deemed of sufficient importance to justify such an exponent, and *The Horseless Age*, a monthly publication, is received from New York. If it continues to exist it will probably change its name, which, as applied to a publication, means nothing, though it is expressive of what appears to be inevitable so far as the poorer grades of horses are concerned. An ordinary specimen of that much-neglected quadruped sold last week in San Bernardino for $1.50, the halter that the poor beast wore being the chief inducement for purchase.

"The Flood of Gold."

A recent authoritative statement that the world's gold output this year will be $200,000,000 has occasioned considerable comment. The fact is worth considering; the probability is worthy of comment.

That the aggregate gold yield of '95 should double that of '87, and that the probabilities favor an indefinite annual continuation of such extraordinary increase, is a matter of tremendous import. The topic is too important to admit of treatment from a partisan standpoint. The widest horizon is essential to a just view of the case. The diminishing output of silver and the increasing yield of gold seems to be Nature's way of restoring the disturbed equilibrium. The demonetization of silver is at last being condoned by the natural action of supply and demand, and the world-wide panic of '93 and attendant lowering of prices (the culmination of disaster resultant upon the demonetization of silver) now give way to a more prosperous order of things. Prices are on the up grade. The pendulum swings the other way. Prices have for years been steadily falling, which is only another way of saying that the purchasing power of gold has been steadily rising. That this is denied by monometallists does not disprove the facts, which are demonstrable by trite statistics. Those who even now argue that the "flood of gold" must result in a further lowering of prices appear to forget that an increase is constantly necessary in the volume of current money proportional to the steady increase in population. Our national progress and prosperity have been handicapped by contraction of the currency; if the increased output of gold results in the expansion of our national money volume, it will only be in a commensurate degree with increasing requirements. Free coinage of gold and silver for the next ten years would not give us any more than we need.

It is to be borne in mind that this whole gold and silver question is largely, almost wholly, a matter of trade balance. The gold that flows to Europe under our silly laws which make profitable the bond issues that are the shame of this country's system of financiering, does not go as money but as gold bullion, stamped and certified as to quality and value. In the broadest sense the increase in the production of gold gives no guarantee of an increase of amount in circulation, or of money at all. The mining of gold is merely the production of a commodity, just as is the mining of coal or silver or copper or iron or quicksilver. It will be prosecuted just as long as it is profitable; should profit cease, there would be a cessation as in the case of silver. Whatever the dollar, whether gold, silver or paper, it is not a standard of value; it is simply a measure of value, the same as a cental is a measure of quantity or a yardstick a measure of length. Money gets into circulation through the demands of business, and not through the production of metal. Hence it is the revival of business that will start money circulating. The mere minting of money will not create business prosperity. We see this around us in California: idle men and idle money; the banks bursting with their hundreds of millions, paying a poor 4½ per cent; foreclosure of mortgaged farms, and low prices for every product because of business stagnation. We see it also in the "Kaffir craze" across the sea, where the congestion of European money causes careless investment of a billion and a half in meretricious mining stocks. Capital withdrawn from legitimate business and enterprises cannot be forever hoarded; it seeks some form of investment and takes undue risks. What is needed is to have the hoarded money go out in such a manner as to create new business, so that merchants sell more, manufacturers make more, railroads earn more.

It is a principle of binomics that the smaller the supply of any article, with equal demand, the greater its price—whether gold or labor or potatoes; hence the contraction of the currency to a gold basis increases the value of the gold dollar, so, even without the just remonetization of silver, the working of this rule would make an increase in prices resultant upon increased gold output, this general principle being modified by the fact cited regarding trade balances. In this as in all other cases value is controlled by the law of supply and demand, but no matter how much the production of gold may increase, it can never wholly fill the place of silver to the exclusion of that metal from its rightful position in the national or international currency. The increase in the gold output will increase silver values, and, in a wider sense than local markets afford, aid the California farmer or wheat grower by lessening his present disadvantage with East Indian and Argentine competitors in London.

AS "there is nothing good or bad in this world but thinking makes it so," in like manner our views on all topics are largely influenced by environments and training. Most of the world welcomes the prospective "flood of gold" and rejoices in the increased output. There is one class that views it with alarm. It is the London bankers, whose opinion is carefully obtained by our subservient American financiers before acting. In the current number of the London *Bankers' Magazine* W. B. Lawson, an able exponent of his point of view, discourses dolorously on a "glut of gold," and says "the right of free coinage of gold may have to be suspended in England." It is amusing to read such pessimistic predictions, and it is the irony of fate that the first suggestion of gold's dethronement should come from the most devout worshippers at the shrine of monometallism. Mr. Lawson goes on to argue for restriction. He speaks of "the evil of excessive currency," and says for that evil restriction is the only remedy. From Mr. Lawson's business standpoint he is all right; from the standpoint of the world's producers he is all wrong. In his article he goes on to admit much that he heretofore denied and that bimetallists claimed, especially that the increased gold output will cause prices to advance. There is no originality in his prophesy about the demonetization of gold. Forty-five years ago eminent European financiers, alarmed at the Californian and Australian gold output, talked of the demonetization of gold to protect the holders of interest-bearing securities from loss; but in these sunset years of the nineteenth century such narrow argument has no place. Rapid transit of thought and person has changed mankind and made the world a small place. Meanwhile, in the late light from London and Mr. Lawson's solemn utterance it would be interesting to get Mr. Cleveland's or Mr. Carlisle's views on what constitutes "sound money." Should gold fail all these worthy gentlemen, the only thing consistent about them would be their inconsistency. While it is neither the province nor the purpose of the MINING AND SCIENTIFIC PRESS to discuss political questions, yet this matter of gold output and silver remonetization is so interwoven with the necessities of mankind and the business of the world that in any reference to these questions the attitude of our public men in power is of necessary note. The United States has been singularly unfortunate in its dearth of financiers, and in the ready acquiescence of so many of its public men in the views and purposes of its great commercial rival. It is high time for a new financial Declaration of Independence. The amusing part of the article referred to is the evident idea that to scare and annoy the business world is profitable to the disturbers. Hardly have the echoes died away of the cry that "we are to be ruined by the flood of silver," than comes from the same source an announcement that we are to be ruined by "a glut of gold." Treading on the heels of the successful demand for the suspension of free silver coinage comes from the same stampeders a threat of similar demand regarding free gold coinage. In financial storms such wreckers always find profit, and while they can dupe our public men they will continue the game. The most recent utterance of a United States "financier" shows how ready our public men are to even falsify history and distort known facts in an effort to keep in unison with their political masters and the transatlantic source of inspiration. On page 357 of this issue appears a synopsis of Director of the Mint Preston's report to his chief, Secretary Carlisle, who bought the right to retain his position by recanting his former truthful utterances regarding silver, in hopes of pleasing his master, the chief executive of the nation, who, in turn, takes for his guide such worthy foreign authorities as the London *Bankers' Magazine*, which, as shown above, takes so doleful a view of the increased production of gold. Mr.

Preston, in his annual report, takes occasion to refer to the demonetization of silver and says its real demonetization took place twenty years before 1873, when the weight of the subsidiary silver coins was reduced seven per cent. He says such reduction was made for the deliberate purpose of placing the country on a gold standard as to large transactions. If the director of the mint had given this part of the report any thought beyond an impulsive desire to curry favor with Messrs. Carlisle and Cleveland, he would have seen that he was saying that which was not and is not so, and that his official assertions were and are in exact opposition to the official facts. The weight of the subsidiary United States silver coins was reduced in 1853 because at that time they were worth by weight more than their face value, and to prevent their exportation, to keep them in circulation in this country, their weight was redueed. There was no talk nor thought of demonetization of silver, nor any proposed change in the then existing law regarding free coinage of silver. That Mr. Preston, as a private individual, should be ignorant of these facts is purely a matter of personal regret, but when, as a public official, holding high position in the financial affairs of the United States, he officially makes such misstatements he is deserving of censure. Official utterances usually carry such weight that it would seem as though Mr. Preston prostituted his high place in putting in his official report what is not so, and what everyone—except Mr. Preston—knows is not so.

Concentrates.

COLORADO now has nine mining-stock exchanges.

CRIPPLE CREEK, COLORADO, has now 162 shipping mines.

THE Chicago Mining Stock Exchange was incorporated this week.

GOV. HUGHES declares that Arizona will produce $10,000,000 in gold this year.

THE total mineral production of Mexico for the last fiscal year was $71,261,000.

WERE California as densely populated as Rhode Island, the State would have 55,224,000 inhabitants.

IDAHO'S Supreme Court last Saturday decided that a mining location made by an attorney in fact is valid.

A 10-STAMP mill on the Rainbow mine near Washington, Cal., is reported carried away by a landslide.

IN '94 New Mexico mines yielded a total gold value of $802,550; silver, $214,060; lead, $49,300; and copper, $13,600.

IDAHO is credited in the report of the Director of the Mint with a gold output in '94 of $2,308,775; silver, $4,879,855; lead, $2,605,450.

FROM Minas Prietas, Sonora, Mexico, it is reported that the 40-stamp mill at the Prietas will be replaced by a new 80-stamp mill.

NEW mining incorporations average about three a day in El Paso Co., Colorado. The "capital stock" is usually "one million dollars."

THE Mountain Mines Co., Shasta Co., expect to consume 150,000 pounds fresh meat per month, which is not an extravagant supply for 1000 men.

ACCORDING to the Johannesburg, South Africa, *Star*, a 404-foot shaft that it describes, sunk there, cost £20 8s 11d per foot; $102 a foot sounds high.

THE Young America quartz mine and mill at Downieville, Sierra county, with about 150,000 tons of tailings, will be sold at auction next Tuesday.

PETER TAUTPHAUS, president of the Providence Mining Co., E. F. Liebrich and F. Boeckman have taken a bond on the Sierra Buttos mine, Sierra City.

OPENING the Nez Perce, Idaho, reservation, which took place on the 18th inst., has added considerable rich territory to the mining area of the Northwest.

AT Tucson, Arizona, the government suit against the Copper Queen Co., charged with cutting timber on government land, resulted in a disagreement of the jury.

OFFICIAL STATISTICS give Arizona's gold production in '94 a value of $1,926,260; of silver, 1,539,453 ounces were mined; of copper, 31,162,400 pounds; and lead, 2,625,000 pounds.

TWO THOUSAND DOLLARS from twelve pounds of "rich ore" is the latest, this time by a miner named Dunn, at Quartzburg, Or., as reported in the Long Creek, Or., *Eagle*.

A RECENT Alaska steamer carried a shipment of T rails and fish-plates to be used in constructing a railroad in the Treadwell mine, on Douglass Island, Alaska's first railroad.

ALASKA'S gold output this year, it is estimated, will be $3,000,000, nearly $800,000 of which has been obtained from placer mining, chiefly along the Yukon river. There are about 500 stamps in operation.

THE Big Blackfoot Milling Company has a permit from the Montana Land Commissioners to cut 24,520,000 feet of timber from Montana school lands. The company is to pay $1.28½ per thousand in three years.

THE Anaconda Mining Company has filed a suit for $375,000 damages against the Butte & Boston Mining Company for ore alleged to have been extracted from the Wild Bill through the Gray Rock workings.

AT Leesburg, Idaho, the Leesburg Mining Company have expended $75,000 this season in constructing 3½ miles of ditch and 1¼ miles of flume. The company expects to be able to work its placer ground about eight months in the year. Operations are being conducted under the supervision of A. J. Bowie of this city.

THE photograph of the Gold Dredging Company's plant at Bannack, Montana, from which the illustration on the front page of this issue was engraved, was taken by John F. Schultz of Butte, Montana.

THE concern that has hold of the Dunderberg property, near Bridgeport, Mono Co., Cal., is known as the Mines Exploitation Syndicate of London. The announced capital is $312,500, of which $12,500 is working capital.

AT the Robinson (South Africa) mine, the October production of the 120 stamps, crushing 15,951 tons, was 15,192 ounces gold; from concentrates by chlorination, 983 ounces, and from tailings by the cyanide process, 1952 ounces.

ABOUT $20,000 was cleaned up last week by Portuguese miners in the Spring Valley mine at Cherokee, Butte Co., an amount taken from the bottom of the big mine, where the ground was supposed to have been all worked out.

FOR the calendar year '94, W. J. Puckett reports to the Director of the Mint that the production of the metals in Colorado was: Gold, $10,616,463; silver (at sixty-three cents per ounce), $14,961,525; lead, $3,199,175; copper, $761,575.

THE Anaconda *Standard* says that between 1500 and 2000 more men are employed in and around Butte, Montana, than ever before, even when the silver mines were running. The mines of that district pay out $540,000 per month for wages.

AT the Broken Hill Proprietary (Australia), for the week ending the 7th inst., 6163 tons of ores were treated, yielding 484 tons of lead, containing 139,180 ounces silver, also 1211 tons treated by amalgamating and leaching plants, producing 11,216 ounces silver.

IF all that Geo. Crehore claims is so, Marin county will be among the mineral producing counties of the State. He claims to know of several localities where iron and copper indications justify active development on the slopes of Mt. Tamalpais, between Mill Valley and Redwood canyon.

GRAND LARCENY was the charge on which the Madison Co., Montana, grand jury bound over Jacob Newman, who stole a stamp mill. The fact that after stealing it he sold it to a mining company, is locally considered as justifying the application of the term "grand" to the larceny.

SUPERINTENDENT ADAMS of the United States mint, Carson, Nevada, estimates the Nevada yield of gold and silver for the calendar year '94 to be: Gold, $1,220,700; silver, $997,500; the first time in the history of that State or Territory when the gold yield exceeded that of silver in any one year.

MR. E. B. BRADEN, in charge of the United States assay office at Helena, Montana, reports to the Director of the Mint that the gold output of that State for '94 was of the value of $3,868,428.87; during the year Montana mined 13,638,967.29 ounces fine silver, 186,310,472 pounds copper, and 23,566,188 pounds lead.

EVERY Comstock miner the world over will remember "the Geiger grade," and read with some interest of the death at Bishop, Cal., on the 25th inst. of D. M. Geiger, its builder. He was thrown from his horse and dragged to death. At one time his income from tolls on the famous road he built was over $5000 per month.

SIGNS in the desert, indicating the trail and giving directions to the nearest springs and wells of fresh water, have been erected by San Diego and San Bernardino counties. They are made of gas-pipe, with squares of sheet-iron at the top, painted red, as that is the color that can be seen the greatest distance in that region.

LAST FEBRUARY there was one log house on the site of the mining town of Rossland, B. C. There are now 3000 people there, the town has electric lights, a telephone system and waterworks are being put in. Rossland is in Trail Creek district, about eight miles from the boundary line. Three-fourths of the mining interests there are held by residents of Spokane.

THE $50,000 infringement of patent suit of Mrs. Carmen L. Morris, widow of Frederick Morris, against Alvinza Hayward and C. D. Lane, for using inclined canvas tables in the Utica mine to catch the gold, was decided in favor of the defendants in the United States Circuit Court, last week, the court declaring that the tables were not an infringement of Morris' concentrator.

MR. CHARLES G. YALE, statistician of the San Francisco United States mint, in an article on Alaska, in the work published by the Government under the auspices of Director Preston, entitled "Production of Gold and Silver in the United States in 1894," places the product of gold in Alaska in '94 at $1,282,623.13, and silver, $5,716.55. The figures for the preceding year were $1,038,824 and $10,983.92 respectively.

TWENTY contested land cases were decided by the register and receiver of the Sacramento Land Office last week, thirteen in Nevada county and seven in El Dorado county. In all the cases the question at issue was between claimants who held that the land in controversy was mineral and the railroad company which held that it was agricultural. Five cases were decided against the railroad company and fifteen in its favor.

A BRITISH COLUMBIA CAPITALIST has conceived the idea of putting traction engines on the Cariboo road from Ashcroft to the Cariboo mining country, to haul in supplies and take out the product of the mines. He says the plan is feasible, as the engines could haul several cars and make the grades with ease, and maintain a speed of four miles an hour over the government road. The plan is being opposed by the teamsters who have heretofore hauled supplies.

REGARDING Oregon's gold yield for 1894 the most reliable procurable data give the following figures by counties: Baker $447,995.72, Benton $2,045, Coos $109,353.77, Crook $1,050, Curry $8,800, Douglas $70,879.38, Grant $129,853.06, Hornly $1,500, Jackson $107,647, Josephine $123,676.61, Lane $32,500, Linn $5,000, Malheier $13,500, Marion $985.88, Union $1,059,070; total, $2,113,356.42. For the current year it is believed the gold yield of the State will aggregate over $3,000,000.

TO AID the unemployed in gaining a livelihood, the authorities in New South Wales give to each suitable applicant a railway pass to the gold fields, a miner's right for which he must ultimately pay, and instructions how to hunt for the precious metal. Out there they call such prospecting "fossicking," and two "fossickers" who were thus aided by the Government have been so successful that they are claiming a reward offered for the best strike in a certain territory.

TO DATE the gold coinage at the United States mint runs over $21,500,000 for '95. During the first three months of the year there were coined in gold $6,002,500; for the second quarter, $5,017,500; for the third quarter, $6,402,500; during October and November, about $4,000,000. The silver coinage at the local mint aggregates $1,500,000 for the same period. The mint now holds about $5,000,000 gold reserve. At the subtreasury, on Commercial street, there are about 25,000,000 silver dollars, $12,000,000 gold, and $3,000,000 currency.

THE production of the copper mines of the United States for the month of October amounted to 36,100,000 pounds, as against 34,400,000 for September; the October production of foreign mines was 17,360,000 pounds, as against 15,556,800 pounds for the preceding month. The increase in the production amounts to 1,700,000 pounds of domestic and 1,803,200 pounds of foreign copper. The exports from the United States during October amounted to 8,510,000 pounds, as against 9,184,000 pounds for September, a decrease of 674,000 pounds.

C. HUNTLY was instantly killed near Silver City, Nevada, on the 21th. He was employed at French's stamp mill, operated by an overshot water wheel. The wheel was clogged with ice, preventing it from moving. Huntly was freeing it from the ice with a pick, when the wheel began revolving. Huntly's head and the upper portion of his body were caught by an arm of the wheel and whirled around with great velocity until his body caught between the flange of the wheel and one of the posts supporting it, crushing him to death. Deceased was a native of Illinois, aged 56.

THE twenty-five cent assessment levied by the directors of the Consolidated California & Virginia Mining Company on the 216,000 shares is the first assessment since March 6, 1894, when one of 50 cents per share, aggregating $108,000, was levied. Since then four dividends of 25 cents each, making a total of $216,000, have been paid. The forthcoming assessment, together with the bullion received, will carry them for some time. They are now going back to that part of California ground below the 1750 level, from whence they were driven by fire several years ago, when they were in good grade ore which went 60% gold.

AT the annual meeting of the Occidental Mining Company 98,423 shares were represented. The following officers were elected: George R. Wells, president; Nat T. Messer, vice-president; and H. Zadig, A. S. Wollberg and W. E. Edwards directors; A. K. Durbrow was re-elected secretary and J. H. Kinkead superintendent. The secretary's financial statement showed a credit of $2380. The superintendent's annual report shows that during the year they have driven 1590 feet of drifts, crosscuts, upraises and winzes, and have accumulated about 300 tons of ore of the average assay value of $30 per ton, none of which had as yet been milled.

SINCE the Japanese Mint was established in Osaka, the Japanese silver yen has been circulating in all Eastern markets from Singapore to Shanghai. The merchants of Hongkong have long agitated for a British dollar, and the Bombay Mint has commanded the coinage of the much-desired dollar. It is a clumsily designed affair, and has been universally condemned from an artistic point of view, but its ugliness will not interfere with its utility. The French in Indo-China, where also the Japanese yen has largely gone into circulation, have decided to assimilate the weight of the French trade dollar to that of the Japanese coin; and as the steamers of the Messageries Maritimes are required, by their contract, to carry public funds free of charge, the trade dollar can be brought to its Eastern place of circulation more cheaply than either the British dollar or the yen. With chopped Mexicans, Hongkong britannias, Saigon trades, Japanese yen and Chinese taels, the currency of the Far East is becoming somewhat complicated.

"THE Cyanide Process and the Cyanide Patents; a Guide to Relief from Royalty," is a pamphlet by G. G. Turri of Melbourne, Australia, in which the recent legal proceedings are discussed. On page 16 occurs this paragraph: "The enormous fortune the proprietors of the patent have made by royalties, and by selling rights, is without parallel in gold mining. The Mexican Cold Recovery Company paid £145,000 for patent rights in that country; and in South Africa by this time probably about half a million sterling has been paid or is payable in royalties alone. The Transvaal patent is a three-fold process, and it may possibly hold good on that ground. More than two hundred thousand ounces of gold are now extracted monthly in that one country. The royalty is 7s 6d an ounce (in some places it is said 5s are taken) and this means, reckoned that 60,000 ounces of this was cyanide gold, a royalty of over £22,000 per month, and as the battery power on the Rand is now being increased some fifty per cent, the royalty promises to be ere long $1000 per day."

THE executive committee of the California State Miners' Association met at the Palace Hotel in this city last Tuesday evening to discuss desired legislation in the Congress which meets next Monday. The bill for the examination and classification of mineral lands in this State, the full text of which was recently published in this paper, was thoroughly discussed. Some of the committee urged the immediate introduction of the bill in Congress; others thought it would be well to first see what the Southern Pacific Railroad Company thought about it, it being urged that some understanding in the matter should first be had with that corporation. The debate resulted in the selection of Chairman T. L. Ford of the legislative committee and Chairman W. C. Ralston of the mineral lands committee to submit a draft of the proposed mineral land classification bill to the railroad company for inspection, suggestions, etc. There were other matters of proposed important legislation, which will be taken up at another meeting of the executive committee to be held next Tuesday evening. Regarding the proposed congressional appropriation for construction of dams, President Neff stated that Robert Devlin, the attorney of the Anti-Debris Association, was of the expressed opinion that the farmers and valley residents were willing to unite with the miners in an effort to secure congressional aid, either by dredging or building dams under Government inspection.

Notes on Gold Milling in California.

NUMBER III.

By E. B. PRESTON, M. E., Field Assistant State Mining Bureau.*

Stamp-Heads, Bosses, or Sockets.—They are made of cast iron or steel, of the same diameter as the cylindrical part of the shoes and dies, with two conical sockets; the upper one accurately bored out to contaiu the taperiug end of the stem, and the lower one to receive the neck or shank of the shoe with its inclosing circle of thin wooden wedges. Transverse, rectangular keyways, at right angles to each other, pass through the stamp-head at the end of the conical openings, counecting therewith iu such a manner that when hoth stem and shoe are attached to the boss they protrude into the keyways. This enahles them to he forced out hy the driviug in of a wedge-shaped steel drift ahout 1 inch wide, 18 iuches long, and tapering down from 2 inches toward the point. The ends of the stamp-head are usually reinforced hy haviug iron hands shrunk onto them.

Stems.—They are made of wrought iron or soft steel, turned perfectly true, and tapered at both ends for a distance of 6 or 8 inches. They are from 11 to 14 feet in length, the diameter varying with the weight of the stamp from 2⅞ to 3½ inches. They are reversihle, so that if one end hreaks, the other end can he used hefore sending to the shop for repairs. Wheu the repair is made, the whole stem should be annealed. The stem carries the greater weight of any part of the stamp, amounting to nearly one-half. The stems hang in the guides at even distances from center to center, aud are supported while at rest hy props or fingers catching on the under face of the tappets.

Tappets.—They are made of tough iron or steel, cylindrical, with a flange on both ends, and accurately bored through the center, a shade wider than the stem, and counter-hored at hoth ends; they are provided with rectangular recess adjoining the central hored hole, 7 to 8 inches long, and from 2 to 2½ inches wide, in which a gih is fitted. This is a piece of wrought irou or steel, grooved ou one side, with curvature one-eighth iuch smaller than that of the stem, aud planed fiat ou the opposite side. Two, or in some cases three, slots are cut through the tappet betweeu the flanges, at right angles to the stem, which counect with the rectangular recess for the gib, so that keys, when driven through the slot, press the gib against the stem, which should slide smoothly through the center of the tappet. The tappets are faced on hoth ends, and are reversihle. The keys are of steel, fitted and marked. Tappets weigh from 100 to 120 lbs. When fastening the tappet, the keys are driven in solid; but care must be ohserved, as when too tightly keyed, the tappet is liahle to split.

Cams.—They are of tough cast iron or steel, double armed, and strengthened hy a hub; which latter is frequently reinforced by having a wrought-iron ring shrunk on. The cam itself is the involute of a circle having for its radius the distauce between the center of the stem and the cam-shaft, somewhat flattened, however, at the poiut of the cam. It comprises a face from 2 to 3 inches wide, ground off, decreasing in thickness from the huh to the point, and strengthened hy a rih on the under side, which runs from a point to several inches deep at the huh. The cam is fastened to the cam-shaft by steel, hand-fitted keys.

Cam-Shafts.—They are made of wrought iron or soft steel, turned true, with double key-seats, 120° apart for cams, besides key-seats for the driving pulley. The cams are slipped on the cam-shaft with the huh side away from the stem, and keyed solidly in their respective places; they must be placed in such a manner that when the cams are raisiug the stamps, the weight is as nearly evenly distrihuted over the shaft as possible. For this reason proper attention must be given to the sequence in which the stamps are to drop in the hattery. Where the shaft is for ten cams, the followiug order of succession of drops is recommended, viz.: 1, 5, 9, 3, 7—10, 6, 2, 8, 4, and would give a drop in each hattery as follows: 2, 4, 1, 3, 5.

The cam, in picking up a stem on the under side of the tappet, imparts a revolviug motion to tappet and stem, requiring from four to six strokes of the cam to complete oue entire revolution. A too rapid revolutiou indicates the need of lubricating. The revolviug of the stem assists in giving an eveu wear to the faces of the shoes and dies, but it does not impart a grinding action to the stamp, as frequently stated, which can he proved by holding a piece of chalk against the stem duriug its ascent and descent.

Screens and Frames. — Screeus of different materials and with different orifices are used; the materials comprise wire cloth of hrass or steel, tough Russian sheet iron, English tinned plate, and, quite recently, aluminum bronze. The Russian sheet-iron plates are perforated with round holes or slots; the latter are vertical, horizontal, diagonal, or curved, and are either entirely smooth or hurred on the inner side. The latter form is intended for longer wear by closing the burrs with a mallet when too large, therehy prolonging the life of the screen. These screens last from fifteen to thirty-five days. The plates have glossy, planished surfaces, and come in sheets of 28 to 56 inches, costing in San Francisco from 65 to 80 cents per square foot. The English tinned-plate screens come in sheets of 1 to 1½ feet square; they are more flexible than the Russian iron, hence do not permit of the pulp caking along the lower edge when fed high; and, as compared with a Russian iron one of the same perforations, they give a greater discharge, hut they are short lived—averaging about ten days. The tin is burned off before using. Brass screens, costing in San Francisco 36 cents a square foot, are sold in rolls; they give the greatest discharge for an equal area, and last from teu days to two weeks, hut should not be used if cyanide of potassium be used in the hattery, on account of clogging with amalgam. The "aluminum bronze" plates come in sizes similar to the sheet tin plate, but unpuuched, the latter work being done here; they are much longer lived thau either of the other kinds, and have the further advantage that when worn out they can be sold for the value of the metal for remelting; these plates are bought and sold by the pound, and are said to contain 95% of copper and 5% of aluminum. Steel-wire screens are not much used, on account of their liahility to rust. The life of a screeu depends, aside from the manner of feeding, on the width of the mortar, the height of the discharge, and the hardness of the rock. Wide mortar and high discharge are favorable to the preservation of the screen; the form of perforations—round holes, or slots, etc.—influences the discharge area of the screen.

A good deal of confusion exists in interpreting the numbers of the different kind of screens. Wire screens take their numbers from the meshes to the linear inch, while perforated and slotted screens are numbered from the needle used in puuching them, these needle numbers being the same as are used for sewing machines. The sizes most frequently used in gold milling are from No. 6 to No. 9 of the perforated and slotted screens, and from No. 30 to No. 40 of the wire screens. The slots are from one-quarter to one-half inch long, and placed alternating or even in the rows, some being burred on the inner side.

The following tahle gives a comparison of the different varieties, with their uumbers:

No. of Needle.	*Corresponding Mesh.*	*Width of Slot. (Inches.)*	*Weight per Square Foot.*
5	20	0.029	1 15 lbs.
6	25	0 027	1.08 lbs.
7	30	0.024	0.987 lbs.
8	35	0.022	0.918 lbs.
9	40	0.020	0.827 lbs.
10	50	0.018	0.735 lbs.
11	55	0.016	0.666 lbs.
12	60	0.015	0.666 lbs.

The proper size required is a matter for the millman to decide at each mill. The character of the ore and the coarseness of the gold have to be considered, as well as the inside dimensions of the mortar; ore carrying extremely fine gold requiring a finer crushing, as the gold must he freed from the quartz matrix in part if the quicksilver is to act on it; but where this would lead to if carried out to its legitimate end may be imagined, when the writer states that he has ohserved, under the microscope, a particle of quartz that had passed through a No. 9 screen (40-mesh) and still contained several separate hut included particles of gold. Sulphide ores, having a much greater tendency to form slimes, should he crushed as coarse as permissible, and where the sulphides predominate largely, amalgamation in the hattery is hest avoided. The pulp discharged through a screen carries but a small percentage of the size of the orifice; while the largest proportion is much finer, it is possible to use a much coarser screen than the size desired to be obtained without any great detriment, while greatly increasing the output.

The Screen Frame.—It is made from strips of sugar pine 1½ hy 3 inches hroad, mortised, and reversible; usually they are made to close the entire discharge opening, grooves heing cast on the exterior of the mortar for their reception. It is frequently strengthened with one or more vertical ribs across the center opening, and is faced with iron plate on those portions of the side and hottom that come in contact with the iron keys that hold the frame solid against the mortar. In some mills the frame is made several inches lower than the opening, to permit the millmen to observe the interior of the mortar while in action, aud to allow the hand to he introduced to remove any chips that may have passed in with the ore, as these have a tendency to bank up against the screen and interfere with the discharge of the pulp. Where such a screen frame is used the opening ahove is kept covered with a strip of canvas tacked to a wooden rod, laid on the upper projectiug lid, while the loose end of a canvas hangs against the inside of the upper part of the screen frame.

(To be Continued.)

*Bulletin No. 6, California State Mining Bureau.

The Cyanide Process of Gold Extraction.

TO THE EDITOR:—I notice at the meeting of the African Gold Recovery Company, held recently, Mr. Charles McCulloch, the chairman, gave an account of the MacArthur-Forrest patent litigation, and how the patent had been made valid (according to his view) by amendment. He says "it is entirely unassailable." These are strong words and must have assured the shareholders that they had now no need to fear the consequence of further litigation as to the validity of the patent. I believe the patent now stands as if the case had never been tried; and should the company again pursue anyone for infringement, new evidence will have to be taken, and new judges will have to deliberate over the case as if the other case had never heen before the court. It is well that it should be so as the evidence given on some points in the former case requires elucidation, especially so on the point of the selective action of cyanide of potassium for the precious metals. I find in the report of the case on appeal Sir R. Webster said: "The dilute solution practically takes out the whole of the gold before it attacks the copper or other metals." Such a feat is easier said than done. I would like very much to have samples of the ore on which such superhuman action was accomplished. I have put through my hands many refractory ores, and I regret to think that this selective action is nothing less than a myth. I have endeavored to find it, but have failed in my attempt to do so. I find that when copper, antimony or zinc is in the ore (and these are the principal metals which contaminate refractory gold and silver ores and on which cyanide has a more or less active dissolving power) there is a very large consumption of cyanide, which bars the use of it for the treatment of such ores. I have never heard that the MacArthur-Forrest process has ever been run on such ores; if it has, it would he interesting to learn where, so that mining men may be posted up to date. There is another part of the case which requires very careful consideration, and more particularly in connection with the recent amendments, viz:—What is a dilute solution; where does it begin and where does it end? It has been proved to the hilt that cyanide in dilute solutions were used as solvents, and more especially in conjunction with an electric current, and also with other chemicals long before the date of the patent. Is the public now to he deprived of the use of a dilute solution, aud in the right proportions found necessary, because someone has taken out a patent for it? Are persons who used it prior to the date of the patent to be held as infringers and also those who have gone on similar lines since its date? These are questions I think can only be answered in the negative. A very interesting paper has been put into my hands hy Mr. Henry Parkes, of 237 Friern Road, Dulwich, London, discoverer of the volumetric method of estimating copper by cyanide of potassium, and used at Burry Port Copper Works, January 26, 1850 (published in the *Mining Journal* March 22, 1851), which throws quite a uew light on this question, and brings to mind the proverh, "There is nothing new under the sun." This document is in the handwriting of Mr. Henry Parkes, and is part of a specification drafted in 1852 for the late Alexander Parkes, with whom he was associated for more than 40 years in developing and carrying out numerous inventions. The late Alexander Parkes was well known as the inventor of the desilverizing process of lead by zinc, and who, in the year 1848, jointly with Mr. John Wright, were the first to apply cyanide of potassium to electro deposition. This part of the specification was dropped out of the patent sealed Novemher 1st, 1852. As this document is of considerahle interest, I quote it verbatim: "The third part of my invention consists in separating gold and silver from their ores or other compounds by means of cyanide of potassium, of sodium or ammonium or other comhinations of cyanogen, capable of dissolving gold or silver. In order to facilitate the operation I prefer that the metallic compound to be operated upon should be in a state of fine division as it is then much more readily soluble. To every ton of gold or silver ore or other compound containing one or hoth of these metals in the proportion of 20 ozs. to the ton, I add ahout 30 lbs. of cyanide of potassium, of sodium or other cyanogen compouud capahle of acting upon the metal or metals present, and from 50 to 100 gallons of water in an iron or other suitahle vessel over a fire, or otherwise heated to form 150 to 180 degrees Fahrenheit. I continue the application of heat, and gently agitate the mass until it is found hy testing that the gold or silver or hoth are dissolved—the time required varies according to the nature of the compound operated upon from one to three or more days. I now filter the solution and wash the residue with water. The solution thus obtained I evaporate to dryness, and then fuse it in any suitahle vessel, when the gold or silver or both will be found reduced, and if not fine must be refined in the usual

manner. The cyanide remaining as a flux after the gold or silver has separated by fusion can be employed for a fresh operation. *I do not confine myself to the proportions above given, as more or less of the solvent must be used according to the nature of the earthy or other impurities and also of the quantity of gold or silver or both present in the compound to be treated.* Nor do I confine myself to the above method of separating the metals from the solution obtained, as other processes may be employed, but I believe the one given to be the best. When silver is combined with sulphur or a sulphuret, and whether such compound has been calcined or otherwise treated, I prefer, when extracting the silver by this process, to boil it with the ferro-cyanide of potassium or sodium, using in this case from 100 to 150 lbs. of the ferro-cyanide to each ton of silver compound to be desilvered, the proportion of water and the method of carrying out the process is the same as when using cyanide compounds to extract the silver. The fourth part of my invention relates to the separation of silver from lead ores or compounds of lead. If the compound containing the silver is in the state of sulphuret, I prefer to calcine to get rid of as much sulphur as possible, then I add about 3 per cent. of common salt and again calcine for a few hours, in order to convert the silver present into a chloride. I now dissolve out the chloride of silver by means of a solution of cyanide of potassium or other compound containing cyanogen, prepared by dissolving 20 to 30 lbs. of the cyanogen compound in 50 gallons of water; these quantities will generally be sufficient for one ton of the compound, more or less being required according to the quantity of silver present. After the silver is dissolved out I either evaporate the solution to dryness and fuse, by which means I obtain the silver in the metallic state, and the cyanide compound will remain ready for a succeeding operation; or I throw down the silver from the solution by means of a dilute acid, as sulphuric or muriatic, and fuse with some flux or reducing agent, when the silver will be reduced to the metallic state. Other solvents may be used in a similar manner in dissolving out the silver from the calcined compound, such as hyposulphite of soda or potash." This specification contains the gist of the MacArthur-Forrest process, and had it uot been the want of a proper process for the extraction of the metals from the solution it might have been in use at the present day. The quantity of cyanide employed seems large, but it must be borne in mind that the cyanide of 43 years ago was very poor stuff. It would have been a very dilute solution if 100 gallons of water were used on a 20 ozs. to the ton orc. I recollect the late Mr. Alex. Parkes telling me that cyanide of potassium was a good solvent of gold and silver in ores, but that he wished to find some combination that would give quicker results. So far as he was concerned it was no secret, and the foregoing specification shows that his knowledge of cyanides was in marked contrast to the evidence given by some of the well-known scientific men of today, who evidently knew little or nothing about it. They seemed to be groping in the dark 50 years behind Parkes. Referring to the above italicised part of the specifications, it will be seen that Mr. Parkes was quite alive to the fact that the cyanide should be porprotioned to the work it had to accomplish. In the second claim of the MacArthur-Forrest process the cyanide is proportioned to the quantity of gold and silver in the ore estimated by assay, but no mention is made of impurities in the ore, which generally consume more cyanide than the precious metals. It is a well-known fact that if the cyanide had only to dissolve the precious metals, the quantity required would be infinitely small compared with the consumption which takes place in almost every ore. Had the above process of Mr. Parkes been employed on the South African tailings, which are so little refractory, and which have been found so easily treated with cyanide, 99% of the precious metals in most cases would have gone into solution in less than half the minimum time specified by him. The want of a satisfactory process for the extraction of the precious metals from the solution no doubt barred Parkes' process as it has done many others; and although it had since been discovered that zinc can be employed for this purpose, that is no reason why a patentee should have the monopoly of a chemical in dilute solution which had already become public property. It is interesting to notice how near Parkes was to the discovery of zinc for the extraction of the precious metals from their solutions. He had actually patented the use of zinc for the extraction of silver from silver-lead. Parkes was well aware of the fact that zinc throws down many of the metals from their cyanide solutions, and based upon this a process for depositing metals without a battery or electrical current, and which he patented provisionally. He also fouud and used as early as 1847 solutions of most of the useful metals, as gold, silver, copper, nickel, zinc, etc. by dissolving the metals directly in alkaline cyanides. It seems not to be generally known that the judges ou appeal in the German case as to the validity of the MacArthur-Forrest patent took quite a different view from the English judges, the High Court at Leipzig having cancelled the patent on appeal.

JOHN C. MONTGOMERIE.

Dalmore, Ayrshire, Scotland, Oct. 28, 1895.

Handling Refractory Placer Ground.

(Continued from page 353.)

electric power plants, because to successfully operate an electric plant of any kind, the prime motor whether it is water, steam or wind, must run at a constant speed, regardless of any variation in the load.

The differential governor, however, overcomes all tendencies to race or slow up in a manner that speaks well for its efficiency. The variations of load in this plant are often from a mere friction load to full load and back to zero in five seconds. The plant has been in operation since June 14th, and as yet there have been no weak spots or defective design found in this governor. The power is transmitted to the dredge by means of two insulated cables that are wound upon a reel at the highest point on the boat. The construction of this reel is such that it is possible to pay out or take in the slack of the cables without stopping the machinery or in any way affecting the operation of the plant. A glance at the illustration will give one a good idea of the plant, noting the general nature of the ground aud the extent to which the bars have been hydraulicked in days gone by. The method of suspending the sluice boxes is also shown. The grade is adjusted by means of chain pulleys, so that as each extra length of sluice box is added, the boxes that are already in position can be lowered or raised if the boat should be dropping astern to begin another cut. The angle through which this boat will swing is about 130°, and not interfere with the sluice boxes. The boxes can be slid over in order to dump the tailings in auy required spot. The ditch that is shown near the summit of the hill, is an extension of a ditch used by Messrs. Graves and Grater, to hydraulic the bench ground they used to own, which is located about two miles south of Bannack City. The boat was laid up for the winter on the 18th ult. The main chain of buckets is raised six feet out of the water, and the boat is run close up to an island. Cribbing is then put into support the buckets. Both auchors are dropped, and the swing lines are hauled taut. In that position the boat will remain until next spring, when operations will be resumed.

Mesh of Battery Screens.

A subscriber writes for information regarding the size of mesh of battery screens, and says: "I enclose you a copy of all the authorities I can get on the matter, and it leaves things a little confusing. What I wish to know is this: Is there such a thing as a standard by which wire or punched tin screens can be gauged? Preston and Eissler agree as to the number of mesh corresponding to number of needle, but differ decidedly from Wagoner as to diameter of orifice. Wagoner, Preston and Louis differ in almost all measurements. Eissler does not give diameter of orifice in his book. Which of the above quoted works is correct?"

NUMBER OF NEEDLE.	1.*		2.*		3.*	4.*	5.*	
	No. of Mesh Corresponding to No. of Needle	Diameter of Orifice, in Inches	Number of Mesh	Diameter of Orifice	Number of Mesh; Diameter of Orifice not given	Diameter of Orifice	Woven Wire Screens. Number Mesh.	Width of Mesh.
1	18	.0436				.057	12	.055
2	18	.0392				.048	14	.049
3	20	.0374				.041	16	.042
4	20	.0340				.035	18	.037
5	24	.0320	20	.029	20	.029	20	.035
							22	.032
6	24	.0284	25	.027	25	.027	24	.030
							27	.027
7	24	.0261	30	.024	30	.024	30	.024
							32	.022
8	30	.0228	35	.022	35	.022	35	.020
9	30	.0203	40	.020	40	.020	40	.017
							45	.015
10	35	.0178	50	.018	50	.018	50	.013
11	40	.0154	55	.016	55	.016	55	.011
12	40	.0148	60	.015	60	.015	60	.010

*1—Given in an article written by Luther Wagoner.
2—Page 27, Bulletin No. 6, State Mining Bureau, by E. B. Preston.
3—Page 40 of "Metallurgy of Gold," by Eissler.
4—Page 125 of "Handbook of Gold Milling," by Henry Louis.
5—Page 128 of Handbook by Louis.

In California, Too.

The papers mention the fact very prominently that a mechanic in New York got a piece of steel in his eyeball, which was drawn out by means of a powerful magnet. Why that should be heralded abroad as a remarkable operation is a mystery. Here in Idaho, where miners so often are thus afflicted by small pieces of steel from drills, they do not so much as call in a professional. They simply get a magnet and draw the steel without aid. Several such operations have been performed by the miners of this county upon their own eyes.—Idaho World.

THE matter of competition is sometimes referred to in San Francisco. Competition is evidently not wholly unknown in New York City, where last week, according to the *Electrical Review*, bids were opened for 1000 feet of insulated wire and four pounds of fuse wire, amounting to about $12.87. Thirteen proposals were submitted, and on the day the bids were opened thirteen salesmen, representiug as many wire firms, were present. Our New York contemporary omits to state to whom the contract was awarded.

Mint Director's Annual Report.

Mint Director Preston, in his annual report to the Secretary of the Treasury, issued this week, says the value of the gold deposited at the Mints and assay offices during the fiscal year was $87,482,082, of which $65,161,007 were original deposits and $22,321,022 were redeposits. The value of the silver deposited during the fiscal year was $15,714,365, of which $15,234,700 were original deposits and $479,665 redeposits. The coinage by the Miuts during the year was: Gold, $43,933,475; silver dollars, $3,-956,011; subsidiary silver coins, $5,113,469; minor coins, $712,594; a total coinage of $53,715,549. In addition to the coinage executed by the Mints during the year, gold bars were manufactured of the value of $43,153,370 and silver bars of the value of $10,841,515. The average London price of silver bullion during the year was 29 pence, equivalent to 63.8 cents. The highest price of silver during the year was 68 ccnts and the lowest price 59.8 cents. At the average price of silver bullion during the fiscal year, the ratio of gold to silver was 1 to 32.5, and the bullion value of a United States silver dollar was $0.49168. The total earnings of the Mints and assay offices during the year was $2,088,372, and the total expenditures $1,185,453, showing the net earniugs from all sources to have been $902,936.

The estimated metallic stock in the United States on July 1, 1895, was: Gold, $636,229,825; silver, $625,853,949, a total of $1,262,085,774. The estimated product of gold and silver in the United States during the calendar year 1894 was: Gold, $39,500,000; silver, 49,500,000 fine ounces, of the commercial value of $31,422,000 and the coinage value of $64,000,000. The estimated production of the world for the year was: Gold, $180,626,100; silver, coining value, $216,892,200; commercial value, $106,722,900.

The coinage of gold aud silver by the various countries of the world, so far as this information has been received for the calendar year 1894, was: Gold, $227,921,032; silver, $106,383,952.

In his report Mr. Preston gives an estimate of the approximate stock of money iu the principal countries of the world. He places the stock of gold at $4,086,800,000; the stock of full legal tender silver at $3,349,300,000; stock of limited tender silver at $631,200,000, making a total silver stock in the world of $4,070,500,000; the uncovered notes are placed at $2,469,500,000.

Mr. Preston, in a review of the monetary legislation of the country, states that the real demonetization of silver took place in 1853, when the weight of the divisional coins was reduced about seven per cent. This, he says, was not an accident nor oversight. It was expressly declared in the House of Representatives that the intention was to make gold the solid standard of value in the large transactions, and silver subservient to it, for small ones. The act of 1873, he says, was only nominal.

In his report the Director of the Mint says that the result of the currency legislation of the United States for over 100 years has been such as to leave an incoherent monetary system as incousistent, illogical and expensive as can well be imagined, that inspires little confidence at home and is not conducive to our credit abroad, and its reform is one of the most important and urgent political and financial questions of the hour. He says that on January 1, 1879, the date of the resumption of specie payments, the only currency, except coin certificates, required to be redeemed in gold coin was the $346,-681,016 legal tender notes then outstanding, which the then Secretary of the Treasury was of the opinion that a gold reserve of $100,000,000 would be sufficient to maiutain, but the paper currency redeemable on presentation has been increased to the extent of $155,930,000 issued in payment of the silver bullion purchases under the act of July 14, 1890. Besides these, there were outstanding November 1, 1895, $333,456,236 in silver certificates, and as the act of July 14, 1890, declared it to be "the established policy of the United States to maintain the two metals at parity with each other," there was now a total of $621,229,532 resting on the basis of the gold reserve of $100,000,000.

HERE is Huxley's definition of a liberal education: "That man," said he, "has a liberal education who has been so trained in youth that his body is the ready servant of his will and does, with ease and pleasure, all the work that, as a mechanism, it is capable of; whose intellect is a clear, cold-logic engiue with all its parts of equal strength and in smooth working order, ready, like a steam engine, to be turned to any kind of work, aud spin the gossamers as well as forge the auchors of his mind; whose mind is stored with a knowledge of the great and fuudamental truths of nature and of the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to a halt by a vigorous will, the servant of a tender conscience; who has learned to love beauty, whether of nature or of art, to hate all vileness, to respect others as himself. Such a one, and no other, has had a liberal education."

Mining Summary.

CALIFORNIA.

Amador.

PINE GROVE.—E. A. Trask is reported to have $50 ore in his tunnel. It is expected that the Wieland mine will soon resume. The Reward mill is turning out considerable bullion.

THE KENNEDY.—Recently discovered ore bodies on the 1050 level of the Kennedy have increased the output, which last month is set at $40,000 in free gold alone.

IRON MASS, VOLCANO DISTRICT. — *Ledger:* The Iron Mass people are making arrangements to crush 1000 tons of ore at the Acme mill, which is about two and a half miles from the Iron Mass.

THE CLINTON, CLINTON DISTRICT.—A company is arranging to reopen the Clinton Consolidated mine, which has been shut down for the past three years. Supplies have been ordered for continuing the work throughout the winter. The shaft is now down 336 feet, and work will be commenced on sinking just as soon as the machinery can be overhauled and supplies placed on the property. The present work is in the hands of Dave Gutman, and he proposes to sink the mine 300 feet deeper before the ledge matter is disturbed.

Butte.

GOLDEN FEATHER. — The general manager writes the company: "After repairing the damage caused by the storm and getting back into the claim, some very rich gravel was struck among the boulders adjoining the bulkhead on the east side of the river, going as high as twenty-five cents to $1 to the pan, but we had driven only a short distance up stream before we came into the narrowest gorge we have yet found in the river, and this gorge was literally packed with enormous river boulders, and the rock wasted into the river during the grading of the old Union Cape flume-bed. Our predecessors had driven a sluice-way underneath the large boulders, which they had blocked up with 12x12 timbers and large posts, and it is evident they were using every exertion to reach the stretch of river immediately ahead of us, and which has at all times been regarded as the cream of the claim. That they were driven out before reaching this ground is proven by the presence at the up-stream face of the gorge through which they were driving of an enormous boulder, which they evidently had not time to blast out. The interstices of the rocks and the underlying bedrock carried rich gravel, through, of course, limited in extent, yet we cleaned up from a distance of about 25 feet nearly $4000. The gorge in the center of the river bed was evidently cleaned out by our predecessors. The weather has been remarkably warm for this season of the year, averaging at noon throughout the past week 95°, and there is every evidence that we will have a long open season. Should this be the case we will undoubtedly get into the open stretch of river ahead of us and work some very rich ground, the richest, probably, in the claim. It is needless to say that we are doing all in our power to accomplish this. We have got the claim in as perfect a shape as it is possible to get it, either for the rapid working of the new section, or to get out without damage and loss should the winter storms set in suddenly."

Calaveras.

THE GWIN MINE.—At the Gwin mine the shaft is 1050 feet deep: the crosscut in the 1000-foot level is in 60 feet and the south drift 30 feet. A ten-inch hole will be drilled down from the bottom of the shaft 250 feet, which will make 1300 feet from the surface. The object is to tap any water in the drifts that may have been run from the old shaft. If the 250 feet of drilling does not tap water, then fifty pounds of dynamite will be exploded at the bottom of the hole, and if no water is tapped then the work of sinking the shaft will be resumed.

THE LONE STAR.—The *Prospect* hears that all the back indebtedness on the Lone Star mine at West Point will soon be paid up and operations resumed in the mine.

NEW ROASTING PROCESS.—At the Scorpion mine, at West Point, A. D. Glace of Oakland is trying a new process of his invention on some rock from the Black Wonder, on Blue mountain. The rock is first run through a fine rock breaker and from there into a set of rollers, where it is crushed, then goes through a chute, a round rotating screen and into a roaster where it is roasted by the superheated steam, then ground finer and passed into the amalgamator, where the bullion is secured.

El Dorado.

IN THE VICINITY OF PLACERVILLE.—(Special Correspondence)—The Pine Hill Gold and Silver Mining Co., composed of South Franciscans, are operating extensively in Gold Hill mining district, nine miles from Placerville. They have a shaft down 150 feet, exposing a large ledge of fine ore. A contract has just been let to continue the shaft 150 feet farther. The ledge will be crosscut again at the 300-foot level. A 10-stamp mill will be erected on this property within the next sixty days, and the owners contemplate enlarging the mill to 60 stamps in the early spring.

The Big Canyon, or Oro Fino, mine is now crosscutting on the 500-foot level with flattering prospects. The 30-stamp mill is being run continuously with satisfactory results. They are milling all the ore between the walls, 90 feet wide, without selection. Also, the main shaft is being sunk below the 500-foot level. This property is owned by Hayward & Lane.

The Church mine is situated about nine miles from Placerville. The mill has been running constantly for many years on high grade ore, and yielding very satisfactory results to its owners. They are now putting in a new hoist on the 1200-foot level, to be run by compressed air. This property is owned by T. Church, Senator Perkins, Hon. J. H. Neff and others.

The Grand Victory mine, situated five miles from Placerville, has just started a new 20-stamp mill, and will soon add 30 more. Their ore body is over 100 feet in width. A recent development was made, in crosscutting from the lower level, of rich ore, which brings the Grand Victory mine to the front among the best gold mines of the State, and she will no doubt soon be heard from in the way of bullion shipments.

The Salisbury mine, which adjoins the Grand Victory on the south, is considered a very promising property and will take rank in due time among the best paying mines in the county.

The Taylor mine is still turning out plenty of the yellow metal, and the 40 stamps are kept continuously going.

The Gentle Annie mine is situated about two miles from Placerville. They have a 10-stamp mill that has been running continuously for three years, making a regular monthly shipment in bullion. The proprietors of this mine, Messrs. Meltou & Carlow, own fourteen claims, known as the Gentle Annie group of mines. Most of these claims were worked with varied success during the early days of California. The 300-foot level in the Gentle Annie has just been opened, exposing a large body of high grade ore.

In the canyon below there was a tunnel started many years ago to cut this property at a depth of 900 feet. After being extended 650 feet it was discontinued until the present time. Within the past week work has been resumed in this tunnel and will be continued until it cuts all the veins in this group of mines, a distance of 1400 feet. The tunnel cuts about 100 feet of roofing slate, near its mouth, of as fine a quality as is found in the State. The gathering of these properties into one group (combined with this tunnel) on the part of J. Melton is considered one of the biggest plans of the kind on the coast.

The 10-stamp mill belonging to T. Clarke and others, three miles from Placerville, is making its regular weekly clean-up, and is considered one of the best paying mines in the State, of its capacity.

The 10-stamp mill started near Grizzly Flat, three weeks ago, by J. Melton is doing exceedingly well.

Fresno.

RIVER MINING.—Captain Barrett's scheme, referred to at considerable length in these columns some months ago, is about completed. He has dammed the San Joaquin river and will change its course to drain a pool at the mouth of Fine Gold gulch, which has been long believed to hold considerable gold.

Lassen.

QUARTZ MILL SOLD.—The Bank of California has sold the old Monitor mine quartz mill to the owners of the Hayseed mine at Hayden Hill, Lassen county. The Hayseed mine is considered an important mining proposition.

Mariposa.

THE LOUISA.—*Gazette:* On the Louisa, sinking operations are being pushed vigorously. The shaft is down about 300 feet. There are three crosscuts—two on the 200 level and one on the 100 level. A drift is also being run on the 100-foot level. For ventilation purposes, a winze is being raised from the 200 level to the 100 level.

MERCED G. M. CO.—The new 40-stamp mill of the Merced G. M. Co. is about ready to begin operations. General Manager Couch, who is now in this city, is credited with intention to build a 500 (?) stamp mill if results from the 40 stamps come up to expectations. In that event, there would be a $500,000 assessment on the stock.

Nevada.

AT MEADOW LAKE. — Miners at Meadow Lake are doing assessment work. Active work will begin next spring on the mine sold by John Clark and his partner to Salt Lake parties. Lumber has been hauled to the mine for the mill to be erected as soon as the snow disappears.

THE GERMAN. — *Herald:* Superintendent Cooley has twelve men at work in the German mine, above Washington. They are now making an upraise from the lower tunnel to the upper tunnel.

LE MARQUE MINE.—Thompson and Maltman show some ore from the Le Marque mine from the depth of 260 feet—ribbon rock full of sulphurets and a sprinkling of free gold. The Le Marque is close to the North Star.

Plumas.

FIVE HUNDRED DOLLARS A DAY.—*National-Bulletin:* Before closing down the Kittle mill for the winter, Standert & McGill realized $500 a day for twenty-five days, on ore from their big quartz mine below the Round Valley reservoir, near Greenville, a profit resulting from the operation of 15 stamps.

THE FREN SCOTT MINE.—In this drift mine, on the North Fork of Feather river, during the past few months, a wide deposit of gravel, an ancient river bar, was passed through, and now the channel seems confined within narrow limits. The drift is now 500 feet up the channel. About twelve men are now employed and will be during the approaching winter. This mine is a part of the Big Flat channel, one of the most extensive in Plumas.

INSPECTING DAMS. — *Independent:* U. S. Debris Engineer Gillette has inspected the ground of the Plumas Blue Gravel Mining Co. at Nelson Point. The company is preparing to put in a substantial dam under the direction of the Debris Commission and once more place this valuable property in active operation. The ground was surveyed by Engineer Vischer some weeks ago and the lines of the proposed improvements established. A permit to work has been granted. Lieutenant Gillette also inspected the dam being constructed in Onion Valley creek by the Good Hope Company, and finding it not up to the requirements of the Commission refused to accept it until it has been raised several feet in height.

An eastern company, who have acquired the claims owned by Orr and Gard and the Upper Rabbit creek or Dutch claim, have constructed a restraining dam in Rabbit creek below the La Porte bridge 30 feet high and 220 feet long, which has been inspected and approved by the Engineer. J. H. Thomas, a former resident of Plumas county, is superintending the refitting and equipping of this property preparatory to a run next season, which it is believed will prove a successful one, as these mines when formerly worked were dividend paying.

Placer.

THE BLACK HAWK BONDED. — *Republican:* The Black Hawk gravel mine, near Forest Hill, has been bonded to a syndicate of San Francisco gentlemen for $40,000. This mine is the property of W. A. Freeman and the W. C. Wallace estate. Work will be commenced immediately on the mine, and no doubt the transfer will be made in due time. The mine promises to be a good one as it is an extension of the Mayflower.

THE MAYFLOWER.—At the Mayflower gravel mine a further ten stamps will shortly be added, making thirty in all. The mill has now been running about a month with the new battery. It was shut down for but twenty days, during which the entire change of machinery was made, under the management of Mr. L. I. Ogden of Forest Hill.

THE EUREKA.—At the Eureka Consolidated, which gives employment at present to fifteen men, all is activity. The tunnel, 6½ feet square, is now in 220 feet out of the 1800 feet which will have to be run before gravel is expected to be struck. Three Burleigh drills will shortly be installed, driven by Rix & Firth compressors, which will considerably expedite the work. All supplies necessary to last through the winter have now been delivered at the mine.

San Bernardino.

THE ALTURA.—Supt. Maude has started the new ten-stamp mill of the Altura near Victor and has opened a body of $20 ore on the 200 ft. level.

San Diego.

PROSPECTS PURCHASED. — Messrs. Dorsey and Grant have been examining gold mines at Picacho and in the White Gold Basin, twenty miles above Yuma, on the Colorado river, and are reported to have purchased the Mura Rica and Dulcina group. Messrs. Selleck and Gaines of New York have options on twenty-one mines in the Picacho Basin and ten in the White Gold Basin. The three companies have a project to build a narrow-gauge railroad from the mines, four and one-half miles, to the Colorado river at Picacho, where the ores from the mills will be crushed. The ores are low grade, but free milling.

(Special Correspondence): The most important mining trasactions ever consummated in Southern California were those made this week whereby United States Senator Stephen W. Dorsey and associates secured the Mina Rica group of mines at Picacho on the Colorado river, twenty miles north of Yuma, in which the rich strike was made some three or four months since. The group consists of the Mina Rica, Dulcenia, Apache, Rica Tierra, Easteru California, and eight others, which adjoin and nearly surround the Dr. Jayne groupe, consistiug of the Mars, Venus, and San George, which have turned out so much gold. The second transaction of note was that by which Jesse R. Grant and associates have secured thirty of the most promising mines in the White Gold Basin, lying two miles east of the Picacho basin and from one to two miles back from the Colorado river, which they will at once prospect, open up and develop.

The third deal was made by H. F. Selleck and E. A. Traves, of New York, by which they bonded twenty-one mines in the Picacho and ten in the White Gold basin, upon which they already have a force of miners at work opening up ready to supply ore for a large mill which they will erect on the bank of the Colorado at Picacho.

Senator Dorsey and associates will construct a narrow-guage railroad from their mines, 4½ miles to the river, at Picacho, where they will at once erect a 100-stamp mill. Selleck and Traves will join them in building the railroad. These three deals, all made during the week, involve an outlay of more than a million dollars at Picacho within the next six months and the opening up of this gold belt.

Wm. A. Farrish, with a force of thirty-four miners, spent seventeen days in experting these properties. He experted the Dr. Jayne group some years since, and was not a stranger to the formation of this mineral belt.

Judge A. B. Richards, one of the owners of the Pueblo smelters, and C. L. Josselyn, of San Diego, have bought some seven or eight very promising claims.

J. L. Curtis and associates have also secured some twelve or thirteen promising properties. Mr. C. is from West Virginia.

J. M. Hay has two fine claims in which Denver parties are interested with him.

Mr. Farrish and Senator Dorsey found in their examinations that the strike made in the Mina Rica mine exteuds into the Dulcenia and crosses the Fleetwing, West Goshen, and runs into the Del Mar mine, and that on the first two it covers an area of 1200 feet in length by more than 400 feet in width.

Thirty-four miners were employed during the examinations of nearly three weeks by Mr. Farrish in crosscutting the veins, clearing out the old works and in opening new ones, and in prospecting and testing the ores, the samples covering more than one hundred tons of different ores from the different veins and mines, the result of which has been to convince the mining men present that the Picacho mines, in the tests made, more than confirm all that has been said of them. Senator Dorsey and Mr. Farrish left for the East and Mr. Grant for San Francisco, but will return in December, when more active operations will be commenced.

Shasta.

WILL DEVELOP THE PROPERTY.—*Free Press:* A. A. Anthony has resigned as superintendent of the Central mining property in Old Diggings; R. G. Hart succeeds him. The mines were recently patented by the owners, Whitehouse & Bliss of New York.

Sierra.

DRIFT MINES NEAR DOWNIEVILLE.—A correspondent of the Downieville *Messenger*, in advocating a new road to the district north of that town, says of the mineral resources thereabouts: There is a lava-capped channel reaching from near the Four Hills down to Brandy City. It is mostly inaccessible on account of no roads, but is being developed a little. There is the Jones Brothers mine, now called the Sunnyside, where they took out thirty thousand dollars in one year from a small piece of ground, in nuggets ranging in value from nine hundred dollars down to the size of your thumb. The Gibraltar is pushing a tunnel into the same channel. Also the Forest Queen and others. This channel is on the divide between the waters of Canyon creek and the North Yuba. Then between the waters of Canyon creek and Slate creek and running parallel with the streams, is another lava-capped channel that has yielded millions of dollars and is only prospected. This channel, as far north as it has been traced, goes from Mount Fillmore down to Howland Flat, St. Louis, Port Wine and Scales. Then another still, that parallels the first two, and is between the waters of Slate creek and Feather river, extending from Pilot Peak down to Gibsonville, Thistle Shaft, La Porte and so on. All the above named channels are only partly developed, and wherever they have been, without an exception they have yielded up their golden treasure in millions of dollars.

THE ALASKA SALE.—The Alaska mine at Pike City has been sold at assignee's sale to an English company, and is now being fitted up for proper working by its new owners. The head of the new company on this coast is K. B. Soule, manager of the Lick House. The business manager of the new company, R. Payne, London, was at Downieville last week. The *Messenger* says it is understood that $50,000 is the true purchase price of the Alaska and Grizzly mines, of which $10,000 were paid in cash upon the debts of the old company, and that the other $40,000 were taken in stock in the new company by the holders of the mortgages upon the property and by the former owners. Frank Kewis, who was foreman under the original Alaska Company when it could not by reason of defective pumps work the rich pay at the bottom of the mine, is in charge under the new company. It is not the purpose of the new company to operate very extensively until the opening of spring. But they intend, ultimately, to drain the 400-foot level where gold is known to exist in great quantities, but which hitherto could not be worked on account of water. The attorneys for the creditors and lien claimants of the preceding Alaska company were busy last week distributing the $10,000 paid upon the indebtedness of the former company. The assignee's sale of the Grizzly mine took place last Wednesday.

Siskiyou.

ASSESSMENT LEVIED.—The Siskiyou Consolidated Mining Co. has levied an assessment of 1 cent per share, delinquent December 19th.

Trinity.

THE ALTOONA MINE.—The Altoona Company has 100 men employed; eighty flasks of quicksilver were brought to Redding on the 15th inst.

AT TAYLOR'S FLAT.—*Journal:* Pelletreau & Hedges have finished a ditch 1¼ miles in length, with a capacity of 500 inches, from Snow gulch to their placer mine, the Highland.

E. Van Winkle, in his drift claim at Little French Bar, has a ditch taking water from Little French creek, with which he supplies water to run an undershot wheel with hydraulic pressure. The water power operates two pumps, used in draining the mine, also hauls the car taking out dirt up an incline, where it is dumped into the sluices. The tunnel is in forty feet and the ground averages $1 to a carload (about three wheelbarrow loads). Four men are employed, and he is averaging an ounce of gold a day to the hand. The lead is about 65 feet wide and is known to extend 400 feet.

Tuolumne.

PROPOSED ELECTRIC POWER.—*Democrat:* The Sonora Electric Light Co. have under consideration a scheme to build above Duckwall canyon a reservoir for water to run an electric plant, from which power is to be furnished for mines above Sonora. The cost of a 75-foot dam at the outlet, the only expense attached to the water storage part of this enterprise, will require the expenditure of $12,500. When completed the storage capacity of the reservoir would be 75,264,000 cubic feet. A dam 100 feet high, at a cost of $20,000, would increase the capacity to 220,000,000 cubic feet. It is proposed to pipe the water from the dam down in the Duckwall canyon to the north fork of the Tuolumne river, where the electric plant will be located.

NEVADA.

HUMBOLDT COUNTY.

KENNEDY DISTRICT.—The Gold Note group of claims in Kennedy has been sold by the Shamrock Company to J. A. Blossom, of Battle Mountain. The sale covers the forty tons of ore on the depot platform for shipment, which will go over $100 per ton.

OREGON.

A Kirbyville paper says at the Mayhelle group of placer mines on Chetco one hundred men are at work digging ditches and doing

other development work. About forty pack animals are run out of Kirbyville every three or four days, carrying supplies and machinery for a double circular saw-mill in course of construction. A portion of the freight for the mines comes via Crescent City from San Francisco.

F. Mallory of Spokane, Wash., has bought two claims owned by W. P. Russell of Spokane and B. B. Shepherd of Baker City for $22,000. The claims are located in the free milling or Virtue district, six miles northeast of Baker City. There is a seven-foot ledge of free milling ore. Mr. Mallory will put in a stamp mill as soon as possible.

JOSEPHINE COUNTY.

The Siskiyou copper mines are fifteen miles northwest of Kerby. Forty men are employed ten putting a bridge across the Illinois river. The smelter is expected to be in operation in three weeks. Six hundred tons of ore are now ready to be reduced. A shaft is being sunk on or near the mouth of the tunnel. The ledge is exposed 60 feet in length. J. H. Simmons is foreman, W. H. Wood metallurgist. The smelter will treat 30 tons per day. It has four tons capacity. The blower will furnish a blast for six furnaces, should they be put in. A 16-foot overshot water wheel, three feet abreast, is ready to run; the water is from Fall creek. Special mention should be made of the fluxness of the copper run—60 per cent. Two hundred and fifty bushels or charcoal will be required per day to keep the blast going.

The Elmer Brown copper mine is a new development, five miles southeast of Waldo. A double compartment shaft is being put down. A tunnel is being driven into the opposite hillside. The ore is a carbonate. The vein shows 25 feet wide between walls. Fifteen men are employed. Two dollars per day and board is paid. Robt. Brown is superintendent.

MAY BE OVERRULED.—(Special Correspondence)—Allow me to call the attention of the mining public to the recent decision of the Circuit Court of Josephine county, Oregon, relating to the title to the beds and bars of rivers in the mining region. Your issue of the 23rd inst. contained the notice which I saw of this most remarkable and absurd decision against the mining interests. It was decided, among other things, that the holder of an agricultural patent fronting on the river is entitled to the land to the edge of the "thread" of the stream, or all that part of the channel above high-water mark not actually cover by running water; and this, too, notwithstanding the acknowledged fact that the meander line of the U. S. survey follows high-water mark on each bank. The space, including the bars which are valuable for mining only and of no earthly use to the agriculturist, are thus given bodily to the farmer who won't work them and taken away from the miner who will work them for his own benefit and that of the community. The commonsense view of this question is that the channel of a river between the meander lines of the government survey on each side belongs to the public domain and is therefore open to location for mining purposes. And there is no part of the public domain so free from dispute as to its mineral character as this. There is not a shadow of a chance to claim that it is of more value for agricultural than for mining purposes. It is occupied by bars of sand and gravel and the "thread" of the stream at low water, and is entirely covered by a running current of water—the "thread" of the stream—during the period of high water. Suppose a stream of running water is 200 feet wide at its lowest and 600 feet wide at its highest stage when the "thread" reaches the high-water mark or meander line on each side. This glaringly absurd and partial decision gives all this valuable mineral ground between high and low-water mark to the farmer who has no use for it and don't want it until the miner proves it to be valuable to somebody. The established policy of our government to reserve from agricultural patents all land known to be valuable for mining purposes, is entirely ignored or overruled by this wise decision of an obscure court in Oregon, rendered so boldly in favor of a class who constitute the majority in that locality, and so manifestly contrary to justice and common sense.

WASHINGTON.

THE GOLDEN CHORD. — The Golden Chord mine, Monte Christo district, is again started. The ore is being hauled from the lower terminal of the tramway to the Everett and Monte Cristo railroad and shipped direct to the smelter. The estimated output is 150 tons a week for the present.

BRITISH COLUMBIA.

AMERICAN MONEY DID IT. — President Denois, of the Northwest Mining Association, in an interview in the Chicago *Inter-Ocean* is credited with saying that the Pilot Bay smelter was built by British Columbia capital. New England money built the smelter and bought the Blue Bell mine.

PROPERTIES BONDED. — The option on the Cliff at Rossland expires December 1. At that time the Barnard syndicate must pay S. M. Wharton $34,000 or the bond is forfeited. Mining men from Rossland are of the opinion that the payment will be made.

The Margaret and Violet mines on Tiger creek have been bonded by George Gloyn to the Montreal and British Columbia Mining and Promotion Company for $15,000; the bond expires June 1, 1896.

QUESNELLE FORKS.—The Horsefly hydraulic has close for the season and the men have gone to Ashcroft. The last clean-up yielded $5,000 or $6,000, making $55,000 or $56,000 for the year, and as operating expenses were about $7,000 a month, for the first year the returns are considered good. Everything is in readiness to start washing as soon as the frost is out in the spring.

AT AINSWORTH.—The Number One mine at Ainsworth, which was recently closed down, has resumed with a decreased force.

ALASKA.

FLATTERING REPORTS. — A strike is reported in Birch Creek district, on a small stream three miles below Mastodon creek. The discoverer says in two and a half days he washed out $130 with a gold pan, his largest nugget weighing $53. Glacier creek has turned out about as much gold this season as any creek in Birch Creek district. On the Pelkey claim twenty-two men, each with a gold pan, made a novel test of its richness. They all began work at the same instant and in one hour's time they panned out $4000; the lowest amount taken by any man was $34.

C. K. Zilly of Seattle says: "I have been working in a mine on Mastodon creek, which is a tributary of Birch creek. There are fifty-four claims on Mastodon creek, and, I should judge, twenty or twenty-five are opened up. This is the first season on that creek, and I estimate that the miners took out about $150,000 to $200,000. It is all placer mining. They began early in June and worked until about September 10th, when the frosts began to interfere."

IDAHO.

PAY-DAY AT WARDNER.—The 15th was day-day for the Bunker Hill Company. Nearly $40,000 were distributed among its employees for October labor. On the 20th the Last Chance Company paid about $11,000.

MAMMOTH MINE.—The Mammoth mine, in Summit Flat, in southern Idaho, has recently been sold. The mine has been thoroughly developed at a depth of over 300 feet during the past two years. The ore will mill from $35 to $40 a ton and the vein is from 12 to 14 feet in width.

AROUND PIERCE CITY.—(Special Correspondence)—Pierce City, famed in earlier days for its placers, which in some gulches paid as high as $300 per day, is now showing all indications of being as rich in quartz as it was in placer. There are two mills in operation. Dunn Bros. & Carr own the Democrat mine and other property on Barclay gulch, on which they have a three-stamp mill running continuously, with two shafts in the mine. This property adjoins Dr. Bole's former property, which recently was sold to a Cœur d'Alene Co. for $30,000. First payment was made in August, and it is generally understood that the new owners will commence work either this fall or early next spring.

A good showing for a big mine is on the Idaho mine, owned by Messrs. Miller & Sevey. The vein on top was 7½ feet wide, but it narrowed down to about 3 feet of ore in the first 20 feet; it is free-milling ore and will average between $20 and $30 per ton, picked samples going over $200 per ton. The owners have finished a four-stamp mill, which is now running. A 20-horse power engine furnishes power.

All the discoveries made in this camp have been made in the washed-out placer gulches. There are over 300 men at work on the placers here, making fair wages. Messrs. Coonin & Alvord have very good diggings, which pay them from $8 to $12 a day to the man, shoveling into boxes. Messrs. Howes & Sutherland for the last two years have been putting in a bedrock flume to work Oro Fino creek. They have had a crew of ten men and over all the time. They expect to strike pay ground early next summer.

STRIKE IN THE MORNING STAR. — A rich strike is reported in the Morning Star mine, near Silver City. In the 400-foot level a body of ore was encountered. The pay streak is five feet wide and assays $300 a ton gold.

MONTANA.

EXTENSIVE IMPROVEMENTS.—The Boston & Montana Company will make extensive improvements at the Great Falls smelter and construct new machinery. It is said since the Butte & Boston have been consolidated with the Boston & Montana, it has been decided to abandon the smelter of the former at Butte and have all the ore treated at Great Falls, but such report is not confirmed.

SOUTH DAKOTA.

COPPER MINING COMPANY.—*Pioneer:* Articles of incorporation were filed Saturday for the Black Hills Mining and Smelting Company, with a capital of $500,000; headquarters at Hill City; incorporators, J. H. Scheneck, Sheridan, S. D.; W. J. Highlands and S. P. Dunn, Cleveland, O.; W. B. Gamble, Akron, O.

THE MOFFITT PLANT.—*Pioneer:* It has been a tedious job to put in the fixtures and machinery at the Moffitt plant at Pluma, as the old building, erected origiually for a cyanide, had to be almost completely remodeled; but it will be running by December 1st, as a great share of the work has been done. Nearly all of the machinery was invented and designed by J. R. Moffitt, and put up at the E. F. Cadle & Son's iron works, at Stockton, Cal. The ore crusher is one of Mr. Moffitt's productions. It has a capacity of forty to fifty tons a day, and crushes the ore to a twenty-mesh fineness; the ore will then be carried by an elevator to the oxidizer, which is capable of handling twenty-five tons per day. From this vat it is carried into a pulverizer, where it is ground into a floury fineness, thence it is conveyed upon the plates. The pulverizer has such a motion that the particles of leafy gold are changed into tiny globules, so that nothing will float away over the plates. One hundred tons of Golden Summit ore is stored at the mill, awaiting the start.

UTAH.

PARK DISTRICT.

NOT "A POOR MAN'S CAMP."—Speaking of the recent glowing reports that have been published in regard to the Camp Floyd district, Geo. Kislinghury states to the S. L. *Tribune* that there was but one feature of the boom that he deplored. "There are plenty of men who read the reports that Mercur and the adjacent country are booming, who go to the district without capital and frequently without money to exist on, expecting that it is a poor man's camp, and that in the course of a month or two they will be able to make a stake. They are of the usual floating mining population, expecting to get work at day's pay for awhile, become familiar with the district, and later go out and make a location that will make them rich. I want to say right now that there are no mines sticking out of the ground in that district, and more, that mines that are now developed furnish employment to a given number of men only, and work for day's pay is not as plentiful as is usually supposed. I consider that the supply of skilled mining labor in the district is right now equal to the demand that will exist next June, a time when I believe the camp will furnish employment to nearly 1000 men."

WYOMING.

NEAR SHERIDAN.—Another of the Tremain steam stamps is to be put to work crushing the cement of the Bald Mountain gold district, near Sheridan.

A NEW COMPANY.—The Standard Prospecting and Mining Company of Chicago has incorporated at Cheyenne; capital stock, $5,000,000; incorporators: J. R. Toomer, H. W. Ayres, H. C. Core of Chicago. The company will develop mining properties in Wyoming.

ARIZONA.

GILA COUNTY.

John Kasser, mine superintendent of the Kusser Gold Mining Co., tells the *Bell* that their trial mill-run of seventy tons of ore, sixty tons being low-grade, yielded between $500 and $600. A meeting of the company will be held in New York next week to consider the proposition of adding ten stamps to the mill, thus doubling its present capacity; also to lay a three-inch pipe one mile and a half to bring water to the mill. The mill is now running.

YAVAPAI COUNTY.

WHAT IS IT REALLY WORTH?—*Journal-Miner:* The announcement of a $300,000 deal having been consummated in London on the Leland Stanford and Snipe mining claims, on Groom creek, created considerable surprise. A deal of that magnitude on claims which had never been heard of by three-fourths of the people here was, in fact, enough to create surprise. The *Journal-Miner* was not aware of there being any $300,000 properties lying around loose, and never having even heard of the existence of the above claims had to institute an inquiry in regard to them. The result is that it was learned that the claims formerly belonged to a man named Nick Shlumberger; that he has sunk fifty or sixty feet on the claims without finding anything of value. A man was found who said he had been offered these claims some time since for a horse, as the owner wanted to get out of the country. If these are the facts in the case, it seems incredulous that the prospect holes could ever have been sold for the price named; and if such is the case, it is a serious thing for this country. Men are engaged in trying to secure capital for legitimate mining enterprises, and the unloading of properties of no value whatever on men of means in London will have the effect of giving a black eye not only to this particular section, but to Arizona in general. No words of too severe condemnation can be meted out to any party who will attempt to perpetrate such a fraud for the few paltry dollars benefit that may be individually obtained from it.

COLORADO.

A NEW MINING CAMP.—The new mining camp of West Creek is situated about eight miles northwest of Maoitou Park. A large number of claims have been staked and 500 people are in camp, and busy doing assessment work.

The country is an easy one to prospect to one who has learned to know the rock, which is not the same as Cripple Creek, though the locality is not very far from the camp. The veins crop to the surface very distinctly, and run parallel to each other, so there are no very serious conflicts in the numerous claims laid out. Several assays have been made on ore taken a few feet from the surface. Some ore has been found containing free gold and some with sylvanite.

AT LA PLATA.—The Hayden Mining and Milling Co., composed principally of Chicago capitalists, has bought the J. M. & E. and Double Standard Company's interests in West Mancos. The first-named company had before refused upwards of $100,000 for their holdings; next spring 100 stamps will be added to the twenty-stamp mill now completed in West Mancos.

NEW MEXICO.

A DRAWBACK.—J. D. Hughes, business manager of the Santa Fe *Daily New Mexican*, says: "We don't have a great deal of mining news. There is plenty of good territory, no doubt, but it will never be prospected thoroughly until these land grants are settled. There is no use of a man going to work and hunting out a mine when it may be taken away from him. As soon as these grants, that are plastered all over the State, many of them fraudulent, too, are settled, New Mexico mines will come to the front, and the other resources as well."

THE WASHINGTON MINE.—The District Court at Albuquerque has dissolved the injunction that has kept the Westinghouse mine idle for nearly two years. This is the biggest mine in the Cochita district. The owners will begin taking out ore at once.

VENEZUELA.

SERPENT'S MOUTH, ORINOCO RIVER.—Several hundred miles up the Caroni river is the El Culloa gold mine, producing annually 90,000 ounces, $24 to the ton. From a vertical shaft 1450 feet deep are run various tunnels, in which work 300 natives, the mine being in charge of Americans throughout.

Coast Industrial Notes.

—California exhibits have won seventy-five medals and premiums at the Atlanta Exposition.

—To build the Washington State Capitol at Olympia Keenan of Spokane made the lowest bid—$944,000.

—The most recent result of the rate war between the Oregon railroad and the Oregon steamship companies is a 60% reduction of freight rates by rail, an enormous amount of travel on both lines, and a statement from both sides that they are making money.

—January 1st, '96, the Lower California Pearl Fishery Company, which holds all concessions from the Mexican Government for pearl fishing in the Gulf of California, and off the coast of the State of Oaxaca, will move headquarters and all business from La Paz to Guaymas.

—The Vulcan Iron Works of San Francisco are constructing a Vulcan Wire Ropeway at Empire, Nev., to convey 100 tons of tailings daily, for treatment at the Morgan Mill, also, a Vulcan Ice and Refrigerating plant for the steamship Colon, and an ice-making plant for the Hawaiian Islands.

—Considerable was said some months ago about the International Exposition of Industries and Fine Arts, authorized by the Government of Mexico, but the enterprise seemed to languish. This paper is now informed that the formal opening of the exposition will take place September 15, 1896.

—During October there were shipped over the Northern Pacific Railroad from the State of Washington 565 cars of lumber and 707 cars of shingles. The September shipments were 1232 cars. Cargo shipments from the twelve principal cargo mills of the State for October aggregate 9,973,054 feet lumber shipped to foreign ports and 17,381,141 feet to domestic ports.

—A sharp demand for California wheat from Australia and South Africa is a new factor in the local grain trade, hitherto excluded from all calculations. Five sailing ships are now under charter for Australian ports and for the Cape of Good Hope. This represents at least 25,000 tons. In addition, all the steam freight accommodation to Australia for the next four months has been engaged.

—The Kaslo and Slocan railway is completed. The 33 miles from Kaslo to Cody Creek is built with a view to the heavy traffic in ore from the mines of the Slocan. The connection between the Slocan mining country in British Columbia and the Great Northern road will be carried from the mining region, starting from Sandon and proceeding to Kaslo on Kootenay lake, and thence by lake and river to Bonner's Ferry, which is on the main line of the Great Northern.

—Considerable present attention is given to a new invention of interest to weavers and cloth manufacturers. The Hunt Loom and Fabric Co. is a new local corporation, organized to handle a newly patented attachment, which, it is claimed, will do away with the pickerstick, hobbin and shuttle now in use in every weaver's loom all over the world. Machinists and weavers who have examined it say it doubles the loom's efficiency, while only requiring one-quarter the present required power, thus greatly reducing the cost of manufacture.

—California and San Francisco are awakening to the menace of competition from Japan's pauper labor. Already several kinds of manufactured goods are being imported into this city from Japan, laid down at prices with which under our system of comparatively high-priced labor, California cannot compete. It is the natural outcome of the free-trade doctrine; protection to home industries is the only remedy. If the product of Japanese labor at five cents a day is admitted duty free to the United States it means five cents a day to the laborer here, the same as there. There is no "political doctrine" about this. It is the cold, hard fact.

—Recently the Collector of Customs of this port submitted to the Treasury Department an application from the Alaska Improvement Company for drawback on imported tin entering with domestic lead into solder used in the manufacture of tin cans exported with salmon. Acting Secretary Hamlin replied that as it appeared the quantity of tin contained in the solder so used could be ascertained by an examination of the finished cans the Collector was authorized to allow on the exportation of the cans a drawback equal in amount to the duty paid on the pig tin used in soldering the same, less the legal deduction of 1 per cent. The quantity of the imported pig tin so used might be determined by allowing 1 pound thereof for each 104 cans exported.

—It is stated in Lima, Peru, that in view of the active competition between the representatives of British, French and German companies desirous of undertaking the work of building a new railroad between Lima and Pisco, representatives of American companies should not lose the opportunity of competing for the work. There is already a road connecting that city with Pisco, which is a maritime town 130 miles south-southeast of Lima, near the mouth of the Pisco river, opening into the Pacific, but it is not of a satisfactory nature, and it is proposed to build a new road over a better tract of country at the earliest possible date and on the best terms possible for Peru. There is no doubt that the authorities and the people at large would prefer to see the road built by Americans in preference to the British, French, or German companies, which are desirous of taking the contract. Display of enterprise on the part of Americans there and elsewhere in South America is looked upon with satisfaction, and is much better received than similar advances upon the part of other nations.

Scientific Progress.

The Uses of Coal Tar.

The variety of useful products obtained in the laboratory from coal tar is noticeable. This substance, formerly thrown away as worthless, serves the purpose of the synthetic chemist admirably, inasmuch as it is a very elaborate compound, very cheap and containing a great variety of elements. It has furnished hundreds of new and valuable medicines, particularly antifever remedies. From it are obtained the aniline dyes, which give all the colors of the rainbow. Aniline itself is colorless, its salts having the brilliant hues. From coal tar also saccharine and dulcine have been obtained. Each of them is more than 200 times as sweet as sugar, the latter being more pleasant to the taste.

Formerly no dye material exceeded madder in commercial importance. It was the basis of nearly all dyes, and the root from which it was obtained was grown on a great scale in Europe and Asia. But alizarin obtained from coal tar has destroyed this agricultural industry by driving the plant out of the market. Alizarin is the coloring principle of madder. From coal tar also comes purpurine, which nowadays forms the basis of many dyes. Some time ago Baeyer, a German chemist, manufactured indigo as pure as that yielded by the plant. Commercially speaking the artificial indigo has not been a success, because other dyes made in the laboratory do the same work more cheaply. Everybody knows that the "artificial camphor" sold in the shape of "moth balls" is got from coal tar.

THE modern idea of fireproof construction is not all that is claimed for it, according to the opinion of the chief engineer of New York City's fire department. The objections raised by him are shown in the following extract. He says: Buildings of brick and yellow pine are more easily handled in case of fire, and their contents have more chance of being saved than those of the modern structural steel fireproof blocks. When subjected to intense heat the steel warps, causing destruction as certainly as if the flames consumed the material. As even in the best-constructed buildings there is ordinarily a large amount of material that is combustible, and as the massing of buildings in the great cities is certain under present conditions to lead to the juxtaposition of buildings of dubious safety, it is almost inevitable that a great fire will destroy some superior edifices. A building may be ever so well constructed, but if it is subjected to the intense beat of half a dozen fiercely burning neighbors, it is almost as surely doomed as if it were made of shavings. In such a case the steel beams and the ironwork might be positive instruments of danger, as their warping would bring destruction. It is to be suspected that the science of safe building is not yet mastered; certainly the practice is not.

A PROCESS has been patented in Germany under which the muscular coating of the intestines of animals is divested of both the interior and exterior layers of mucous membrane, and then digested in a pepsin solution until the muscular fibers are half digested. Then it is treated with tannin and gallic acid. The result is a tissue which can take the place of the natural skin, and which, when laid on the wound, is entirely absorbed during the healing process.

EXPERIMENTS in welding metallic bodies by simple pressure at heats below their fusing points, made by the Royal Society of Belgium, show that the most perfect joints are obtained with gold, lead and tin, and the worst with bismuth and antimony. Cylinders of extremely pure metal with smooth surfaces were brought together by a handscrew and kept at a constant temperature between 200° and 400° for from three to twelve hours. When separated the break did not coincide with the joined surfaces. Platinum was softened and welded at a temperature of 1600° below its point of fusion.

GEOLOGICAL SPECIMENS brought home recently from the Antarctic region by a Norwegian explorer have been analyzed and found to contain microlene granite, with garnets and tourmaline and mica schists. As these have never been seen in an ocean island, the conclusion is that a continent exists around the south pole.

A PETROLEUM tank steamer recently launched in England is so arranged as to carry oil cargoes to Asiatic ports and bring back general cargoes. This has been rendered possible, by means of elaborate arrangements made for purifying and ventilating the oil tanks after discharging their liquid cargo.

Electrical Progress.

San Jose's Electric Railway.

Fifty miles from San Francisco is one of the prettiest cities of the State—San Jose—in which the first successful electric railway on the coast began operations, eight years ago. In few places in the United States has electricity been more largely utilized than in that pleasant municipality. No finer roadway is found anywhere than the famous "Alameda," 150 feet wide, three miles long, on which the electric cars speed to Santa Clara. The avenue on which the double track runs is lined throughout its entire length with beautiful homes, handsome grounds still in fullest foliage in bright November sunshine, as depicted in the accompanying engraving. The town of Santa Clara, to which the road extends, is noted as being the site of the first white settlement in the county.



SAN JOSE AND SANTA CLARA ELECTRIC RAILWAY.

Electricity at Paris in 1900.

Paris, France, will celebrate the last year of this century by a World's Fair, at which it is intended to make an electrical display that will fittingly illustrate electrical progress and form eloquent contrast with similar displays in '67, '78 and '89. The power required for lighting will be 12,000-horse power, as compared with 1500-horse power in '89. The power required to show the exhibited machinery and apparatus in motion amounted to 350-horse power in '55, 635-horse power in '67, 2500-horse power in '78, 5500-horse power in '89, and is estimated at 8000-horse power in 1900. The efficiency of the power distribution in Chicago, where a 500-volt continuous current was used, was 73.37 per cent; at Lyons, in '94, where continuous and alternating current was used, it was 73.38 per cent. Assuming 70 per cent total efficiency, the required steam power is stated as 28,500-horse power, reduced to 20,000-horse power by the following schedule:

	Horse Power.
Furnish during the day to motors	11,400
Furnish from 7 P. M. to midnight to one-fourth of the motors	2,000 H. P.
Furnish for light	17,100 H. P. 20,000

In addition a water-power transmission is proposed of 2100-horse power for the dam at Suresness, a distance of somewhat over six miles from the grounds. The assumed efficiencies of 0.75 for the turbines, 0.80 for connection of turbine and generator, 0.90 for the generator and 0.90 for the line, deliver 1170-horse power at the grounds and result in a total efficiency of 0.49.

ELECTROLYSIS—which from the present standpoint can be termed galvanic action—truly exists as such, according to the author of a recent paper, and in large ocean-going vessels causes much trouble. There, tons of zinc are used to offset this action, due partly to using too pure a water on account of the hot-well system, and incited further by the salt water used. It is known that zinc is one of the most positive metals known in galvanic battery work, being more positive than iron. The zinc put into the boiler assumes the position of the positive pole, consequently it is destroyed in place of the iron by the battery solution in the steam boiler. Its reaction and conversion into its oxide is similar to that of the iron, it being destroyed under the same influences.

IT was only a little electric motor, shoved away in a dark corner where the dust could settle down and be undisturbed from New Year's till Christmas — an overworked, dirty little motor—a motor that finally, in fiery language, objected to the ever-increasing load. But the master simply screwed down the brushes more tightly and added an additional burden. Then the little motor concluded that it was time to teach somebody a lesson, and the total cost of that lesson is now estimated by the insurance officials at $65,000. The new motor installed in the new factory will enjoy living in a small, dust-proof apartment, will be regularly and thoroughly cleaned, and probably will never be overworked.—Electrical Engineering.

LONG-DISTANCE TELEPHONES are making some giant strides nowadays, and it will not be long before they will entirely supersede the telegraph. Between New York, Boston and Philadelphia there are now about forty long-distance wires, and in the whole system there are 55,000 miles of pole line and 265,000 miles of wire, and the system is growing fast every day.—Electric Review.

Mechanical Progress.

A Hydraulic Power Plant.

The hydraulic basin from which water is now taken by the Niagara Falls Power and Manufacturing Company for furnishing power to the various mills supplied with power by this company is located parallel to and about 300 feet back from the edge of the high bank of the Niagara river. For this new plant the water will be taken in an open canal from this hydraulic basin to a forebay 30 feet wide and 22 feet deep, which is now being built near to the edge of the high bank. From this forebay penstock pipes built of flange steel, eight feet in diameter, conduct the water down over the high bank 210 feet to the site of the power house on the sloping bank at the edge of the water in the river below the falls.

The site for the power house is now being cleared; broken and disintegrated rock mixed with huge boulders which have fallen over the bank in past ages covered the site in places to a depth of 75 feet. The work of clearing this material from the site of the power house, which is now nearing completion, has been largely done by means of a giant, the process being almost precisely similar to that employed in hydraulicking in this State. The monitor in use at this point is the first one used in the East. Below this debris is a stratum of Medina sandstone, on which the power house will stand.

The building will be 60x100 feet, the intention being to add to the length of the building (60 feet) and place other wheels, fed by separate penstocks, from the same forebay as above, as demand arises. There are four turbine wheels of the horizontal type, furnishing about 8000 horse-power, to be located in the first floor of the power house. These wheels will work under a head of 210 feet, the highest head under which water has ever been used for power in the quantity proposed in this plant. The pressures exerted by water under this head are enormous, and every detail of the penstock and water wheels must be designed with the greatest care to hold it.

The penstock leads from the forebay vertically about 135 feet to the top of the sloping bank, thence down the slope to the side of the station next to the bank, making the total length of the 8-foot pipe about 240 feet. Into the building the pipe, 10 feet in diameter, runs horizontally, suspended over the tail race. The thickness of the steel is fifteen-sixtcenths of an inch. All horizontal joints are butt-strapped, held with three rows of rivets on each side. The cross seams are all double riveted. The necessity for strong work in this pipe will be seen when it is remembered that the total pressure on the end of the pipe exceeds a million pounds. From this horizontal portion of the penstock the water is taken directly up through 60-inch valves on to the water wheels, which are supported upon iron beams stiffened by braces into the side of the tail race.

The wheels are fitted in cases 11 feet in diameter, made of the best heavy plate steel, double riveted. The feeder pipe connection to these large cases are on the bottom, riveted directly to the 5-foot hydraulic cylinder valves. All these valves are connected to the main feeder pipe, which is 10 feet in diameter, and occupy the space under the turbines between the foundation walls. The draft tubes from the turbines pass down each side of the main feeder pipe, connecting with the tail water, which is set at a distance of 27 feet from the center of the turbine shaft.

A New Metal.

Glucinium is the name of a new metal which seems to be destined to become of great importance in the very near future. On account of its peculiar qualities it will be used especially for electrical purposes. As its atomic weight is 9.1, and its specific gravity 2.00, its tractive power is considerably greater than that of iron and its conductibility is equal to that of silver. Glucinium, therefore, is more capable of resistance than iron and a better conductor than copper, and in addition to all that, it is lighter than aluminum. If these claims for this new metal should be confirmed by practical use, there is no doubt that glucinium will be used extensively for electrical purposes, the more so as its commercial value will amount to about $20 a pound, or 160 times less than the same volume and ten times less than the same weight of platinum.—American Manufacturer.

Hardening Steel by Gas.

The Germans are interested in a new process for hardening steel by means of gas. The invention originated with the French steel and iron firm Schneider & Co., of Creuzot. It is a well known fact that gas, under great heat, deposits carbon in solid from. Upon this depends its light effects, and also the formation of the so-called retort graphites, a thick covering of pure carbon on the walls of the gaslight retorts. The gas that strikes the retort walls deposits part of its carbon upon them. This is the fact upon which Schneider bases his invention for cementing together (uniting) steel armor plates. This hardening is obtainable by the application of carbon. Formerly, the process of hardening consisted in covering the plates with layers of coal and heating them till they glowed. Schneider's process puts two plates into a furnace, one on top of the other, with a space between. This space is made gas tight by means of asbestos packing around the edges, and the plates are heated red hot, while a stream of gas is poured into the space indicated. The carbon thrown out by the gas is greedly taken up by the glowing plates until they are thickly covered. The depth of this carbon covering can be regulated by the amount of gas admitted. In order to secure regular and uniform action during the process, and to prevent the pipes that carry the gas to the space from absorbing any carbon, they are insulated in other pipes through which water is constantly circulating. It is believed that this rapid carbonizing process will be applicable to many other branches of the steel industry.

Practical Information.

Splicing Belt Lacings.

A good many ways of splicing belts are described in technical papers, but very little has been said about splicing belt lacings. Usually the workman will tie a knot in two pieces of lace rather than draw the knot snugly up to one side of the belt, and proceed to put in the splices. Sometimes he uses up one piece, then sews in the other piece, tucking both ends underneath. This works pretty well until the lacing begins to start a little; then the ends come out, and the first thing he knows the whole lacing is coming apart. Don't tie a square knot and don't tuck in the ends. Just cut a hole in the end of each piece of lacing; make the hole a distance from the end equal to half the distance of the lacing; put one piece of lacing through the hole in the other piece; then draw that piece through the hole in the first strip; pull this connection down as small as possible, and it will be found to take the shape of a double square knot, making a very smooth and firm splice. It cannot be untied and it does not wear out easily. Such a splice usually lasts as long as the rest of the lacing.

Eggs are now imported to London from Russia, shelled and preserved in hermetically sealed tins, from which they are drawn off through a tap. Eggs in this condition are principally used by pastry cooks, and the advantages claimed for the system are freedom from danger in transport and long keeping qualities. The tin or drum is packed with straw in a wooden case, and holds the contents of 1000 to 1500 eggs, the white and yolk being mixed together, poured into the drum, and the aperture closed with a bung and sealed. Great care is said to be necessary in selecting the eggs to be preserved, as one bad one will spoil the whole cask or drum.

Only one person in fifteen has both eyes in good condition, and in seven cases out of ten one eye, generally the right, is stronger than the other. It is found that just as people are right or left-handed, so they are right or left-sighted, and while apparently looking with both eyes, they often really use only one. Out of twenty persons whose eyes were tested by a German doctor, two only were found to be left-sighted. The reason of the greater strength generally possessed by the right eye is not altogether understood, but probably the natural tendency to the greater use of the right side of the body has something to do with it. In using weapons, for instance, mankind has been taught for ages to assume attitudes in which the right hand and side have most exercise, and this discipline has undoubtedly had its effect on the eye. Old sea captains, after long use of the telescope, find their right eye much stronger than the left—the direct effect of exercise. This law is confirmed by the experience of artists. If a person who has ears of equal hearing power has cause to use one ear more than the other for a long period, the ear brought into requisition is found to be strengthened, and the ear not in use loses its hearing in a corresponding degree.

A complete and immediate revolution of transportation methods, involving a reduction of freight charges on grain from the West to New York of from 50 to 60 per cent, is now predicted. The plan proposes using light and inexpensive corrugated iron cylinders, hung on a slight rail supported on poles from a cross-arm—the whole system involving an expense of not more than $1500 a mile for construction. The rolling stock is equally simple and comparatively inexpensive. Continuous lines of cylinders, moving with no interval to speak of, would carry more grain in a day than a quadruple-track railway. This would constitute a sort of grain pipe line. There is also prophesied the probable abolition of street cars before the coming horseless carriage, which can be operated by a boy on asphalt pavements at a total expense from labor, oil and interest of not more than one dollar a day.

A safety lamp for mines, operating upon a peculiar principle, is being used in Germany. The lamp is not closed in any special way, like other lamps. It matters very little whether or not the workman, disregarding the regulations of the mine, succeeds in opening the lamp, for there is a special arrangement by means of which the flame is extinguished at the same instant. In the interior of the lamp glass is a spring, which is compressed when the upper piece is screwed down, and which enables a cap to operate upon the wick in such a manner as to shift it aside, facilitating the lighting of the lamp, and afterward the combustion. When the spring is worked in the contrary direction, the cap again operates upon the wick, and the flame ceases the moment the cap comes in contact with the air. The lamp can be lighted without being opened. Oil, benzine or petroleum can be used as fuel.

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Personal.

HENRY BURNS is superintendent of the Canyon Creek mine, Trinity county.

C. M. SHAW is the new superintendent of the Black Hornet mine, Boise, Idaho.

M. AUBREY of San Diego has taken charge of the Shenandoah mine at Mesa Grande.

RICHARD WHITE has been appointed foreman of the North Banner mine, near Grass Valley.

B. F. LAEY, of the Park & Lacy Co., has returned from Australia, where he has been sojourning since last April.

C. A. COFFIN, president of the General Electric Co., is credited with intention to resign on the 31st of next month.

THOMAS B. EVERETT, now of Denver, one of the organizers of the Colorado Mining Association, is revisiting Placer county.

R. PAYNE, recently from London, has the superintendency of the Alaska mine, Sierra county, under the new management.

D. D. STEWART, formerly foreman of the Mexican mine, is prospecting some quartz properties in the Berner's Bay, Alaska, district.

CHIEF ENGINEER H. R. LEACH of the Boston has been relieved by a medical board at Mare Island. Another chief engineer will be assigned to the ship.

W. PELLEW-HARVEY is about to deliver a course of lectures in Vancouver, B. C., on the detection of mineral in ores, chemistry, metallurgy and practical assaying.

ALEX SIEMENS is surveying the route for the new cable to be laid up the Amazon from Para to Manaos under concessions from Brazil. The length is 1365 nautical miles.

C. F. LAPE has been appointed superintendent of machinery and car departments of the Southern California, vice G. W. Prescott, resigned, with headquarters at San Bernardino.

BARTON SEWELL of Chicago has been appointed general manager of the United Smelting and Refining Co., which has a smelter at Helena, one at Great Falls, Mont., and a refinery at Chicago.

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING NOVEMBER 19, 1895.

550,120.—RAILWAY—A. Bannister, S. F.
550,037.—PROPELLING VESSELS—J. Bond, Turlock, Cal.
550,038.—CHILIAN MILL—M. P. Boss, S. F.
550,016.—VOTING MACHINE—C. Christensen, Oakland, Cal.
550,067.—VEHICLE BRAKE—J. Christensen, S. F.
550,172.—KEYBOARD—R. Hensley, Salem, Or.
550,175.—LADDER SPLICE—L. G. Holden, Portland, Or.
550,176.—SOLDERING MACHINE—M. Jensen, Astoria, Or.
550,021.—MILK CAN COVER—Jenny Laplace, S. F.
550,036.—DIE—T. O'Leary, S. F.
550,061.—AXLE GAUGE—R. A. Simpson, Ferndale, Cal.
550,141.—PUMP—Smith & Worner, Fairhaven, Wash.
550,207.—BRACKET—H. G. Traeger, Porterville, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

RAILWAY CONSTRUCTION.—Joseph Clark, San Francisco, Cal. No. 549,704. Dated Nov. 12, 1895. The object of this invention is to provide rails and wheels so formed that when run on a level or without any appreciable grade the smooth-faced portion or tread of the wheel will travel upon a corresponding smooth-faced rail, and when inclines or grades are to be overcome a toothed portion of the same wheel will engage with a correspondingly toothed portion of rails laid upon the grade so that the tractile power will be correspondingly increased and slippage of the wheels will he prevented. The invention consists in the combination of wheels having a tread adapted to run upon the face of an ordinary rail flange of larger diameter projecting upon the inside thereof; a gear projecting from the outer side of the wheels, having a diameter smaller than that of the tread portion, with rails having a face upon which the smooth tread of the wheel is adapted to travel and a toothed portion projecting upwardly adapted to he engaged hy the teeth of the wheel when the latter is traveling upon the incline. The right portion of the rails is so constructed as to automatically discharge dirt and foreign suhstances which may fall therein.

DESIGN FOR LAMP CHIMNEY.—Herbert Sanford Malthy of Santa Cruz, Cal. No. 24,858. Dated Nov. 5, 1895. The desigu of this invention consists in a lamp chimney of conventional form having a circumferential flange projecting from its lower straight portion and hroken at intervals to leave intervening spaces, said flange haviug an essentially triangular or V shape in cross section, its upper side being suhstantially horizontal.

PROPULSION OF VESSELS.—John Bond, Turlock, Cal. No. 550,037. Dated Nov. 19, 1895. This invention relates to improvements in the propulsion of vessels. It consists essentially of a chamher formed heneath the hottom and central portion of the vessel and adapted to contain the engines or motor. At each end are eylinders having plungers reciprocating therein and driven by plunger rods which extend through stuffing hoxes into the central chamher, where they connect with the engines. These plungers draw the water in when they recede, and force it out with considerable energy on account of the rapid movement of the piston. But one of the engines is operated at once, the one at the rear heing employed to propel the vessel forward, and the one at the front may he used when it is desired to move the vessel astern.

RAILROAD RAIL.—Alfred Bannister, San Francisco, Cal. No. 550,120. Dated Nov. 19, 1895. This invention consists of a solid steel rail, the upper part heing in eross section, essentially the form of an equiangular trapezoid, having extensions or flanges upon each side forming a solid hase with a width approximately douhle the depth of the rail from top to hottom. In conjunction with this is a wheel having a flange or flanges, the angle of which is slightly greater than that of the side or sides of the rail. The wheel may have either a single flange, like the ordinary railway wheel, or it may have one upon each side which serves to prevent the side oscillation of high rates of speed. The rails are preferahly laid upon continuous longitudinal stringers which are imbedded in the road-bed and are also supported hy suitahly disposed eross ties, adding greatly to the strength of the road-bed. This invention may he an important one. It is of such shape as gives to the metal its greatest possihle strength to resist injury from compression from top or side. It overcomes the pressure of the wheel flange on the inside and top of rail, aud, hy carrying its load always on the center, and never on the side of its tread, removes all leverage to draw spikes out of and force rail base into the stringers. Its great strength is in its hase, whose width is douhle the perpendicular height, so that no tendency to he forced over on to its side hy the pressure of the wheel flange exists and all top-heaviuess is also thus removed. Its great safety against "rail spreading" or upsetting is apparent; and having overeome the pressure of the wheel flange, it makes the longitudinal stringer perfectly safe, and thus, with its six-inch-wide hase, multiplies the rail area resting on the stringers by nearly five and adds to the strength of the road-hed to a still greater extent. The cost does not exceed that of the old rail, while the wear and tear and locomotive power required are much reduced. In short, it infallihly fills all requisite essentials to secure the beam or multiple for height strength, as: 1. The load is uniformly distrihuted across its tread. 2. Its perpendicularity is perfect. 3. The rigidity of its sides is assured. This is not the case with the old rail on much of our present railroads, especially on curves.

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Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munro, Professor, School of Mines, Columbia University, New York City.
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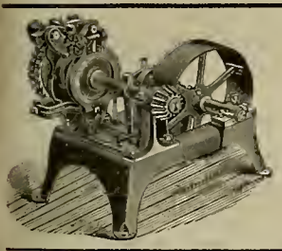


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Peroxide of Sodium,
Hyposulphite of Soda,
Sulphide of Iron,

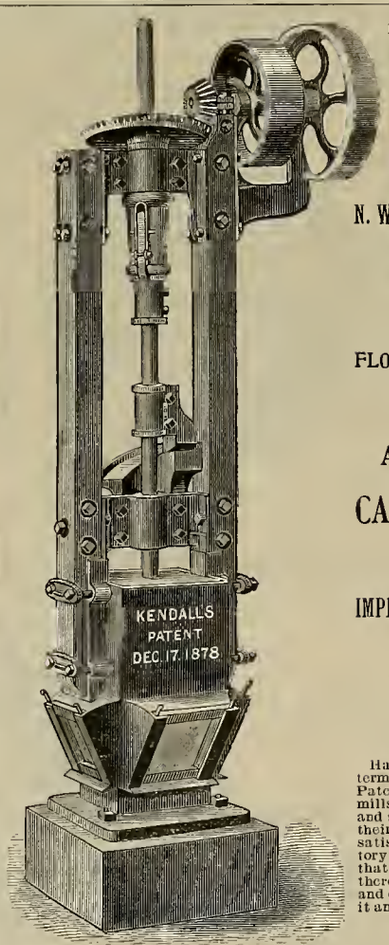
And other Chemicals for Mining Purposes.

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OUR U. S. AND FOREIGN PATENT AGENCY presents many and important advantages as a Home Agency over all others, by reason of long establishment, great experience, thorough system, intimate acquaintance with the subjects of inventions in our own community, and our most extensive law and reference library, containing official American reports, with full copies of U. S. patents since 1872. All worthy inventions patented through Dewey & Co's Patent Agency will have the benefit of a description in the *Mining and Scientific Press.* We transact every branch of patent business, and obtain patents in all countries which grant protection to inventors. The large majority of U. S. and foreign patents issued to inventors on the Pacific Coast have been obtained through our agency. We can give the best and *most reliable* advice as to the patentability of new inventions. Our prices are as low as any first-class agencies in the Eastern States, while our advantages for Pacific Coast inventors are far superior.
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CASTINGS AND FORGINGS
OF EVERY DESCRIPTION.
All work tested and guaranteed.
IMPROVED PORTABLE HOISTING ENGINES.

Sole Manufacturers of

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Having renewed our contract on more advantageous terms with Mr. S. Kendall for the manufacture of his Patent Quartz Mill, we are enabled to offer these mills at **Greatly Reduced Prices.** Having made and sold these mills for the past 14 years, we know their merits, and know that they have given perfect satisfaction to purchasers, as numbers of commendatory testimonials prove. We feel confident, therefore, that at the prices we are now prepared to offer them, there is placed within the reach of all a light, cheap and durable mill that will do all that is claimed for it and give entire satisfaction.
MARSHUTZ & CANTRELL.

Send for Circulars and Price List.

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HIGH GRADE STEEL
SHOES
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Guaranteed to Wear Longer and Prove Cheaper than any others.

Made by use of Special Appliances.

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TUBBS CORDAGE CO.
(A CORPORATION.)

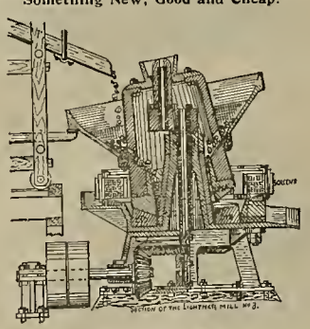
Constantly on hand a full assortment of Manila Rope, Sisal Rope, Duplex Rope, Tarred Manila Rope, Hay Rope, Whale Line, etc., etc. ☞Extra sizes and lengths made to order on short notice
611 and 613 FRONT ST., San Francisco, Cal.

California Inventors

Should consult DEWEY & CO. AMERICAN and FOREIGN PATENT SOLICITORS, for obtaining Patents and Caveats. Established in 1860. Their long experience as journalists and large practice as Patent attorneys enables them to offer Pacific Coast Inventors far better service than they can obtain elsewhere. Send for free circulars of information. No. 220 Market St., San Francisco, Cal.

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PETERSON, MODEL MAKER,
...ET ST., N. E. Corner Front (Up Stairs), SAN ...CO. Experimental machinery and all kinds ...dels. Tin and brasswork. All communications *strictly confidential.*

THE LIGHTNER QUARTZ MILL.
Something New, Good and Cheap.



MANUFACTURED BY
WM. H. BIRCH & CO.
Also Manufacturers of
Cary Steam Pumps, All kinds of Mining Machinery, Boilers, Engines, Ore Buckets, Ore Cars, Cages, Hoists, etc.
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The Pelton System of Power

Represents the highest development yet attained in water wheel practice and affords the most simple, efficient and economical means of utilizing water for power purposes.

Six Thousand Wheels Now Running,

Aggregating over 400,000 horse power. Adaptation made to all conditions and every variety of service.

Electric Power Transmission.

PELTON WHEELS are the recognized standard for electrical work and are running a majority of the stations of this character in all parts of the world.

Catalogues furnished upon application. Address

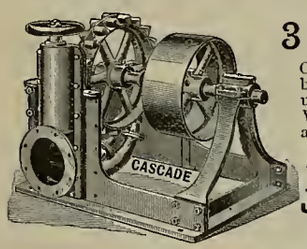
THE PELTON WATER WHEEL CO.,

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TURBINE AND CASCADE WATER WHEEL

Adapted to all Heads from

3 Feet to 2000 Feet.





Our experience of 33 YEARS building Water Wheels enables us to suit every requirement of Water Power Plants. We guarantee satisfaction.

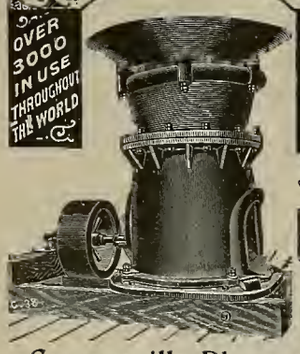
Send for a Pamphlet of either Wheel and write full particulars.

JAMES LEFFEL & CO.

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GATES ROCK AND ORE BREAKER

OVER 3000 IN USE THROUGHOUT THE WORLD



PRODUCES A MORE PERFECT CUBIFORM MATERIAL AND A GREATER QUANTITY IN A GIVEN TIME PER HORSE POWER USED THAN ANY OTHER CRUSHER ON EARTH.

CAPACITIES UP TO 150 TONS PER HOUR. NINE DIFFERENT SIZES.

WE HAVE BUILT THE LARGEST STONE CRUSHING PLANTS IN EXISTENCE

GENERAL MINING MACHINERY

OF EVERY DESCRIPTION.

TREMAIN STEAM STAMPS

Connorsville Blowers, King-Darragh Concentrators, Stamps, Hoists, Rolls, Pans, Settlers, Smelters, Metallurgical Appliances, Etc.

COMPLETE INSTALLATIONS.

Investigate our late Specialties and Improvements in this class of Machinery.

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To Gold Miners!

Silver Plated Copper Amalgam Plates

For Saving Gold.

GOLD REMOVED FROM OLD PLATES AND REPLATED. Old Plates bought. Get our Reduced Rates. Five thousand orders filled. Twenty-five Medals Awarded.

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E. G. DENNISTON, - - - - - - - - - - - Proprietor.

Every description of work plated. Sesd for Circular.

The I. B. HAMMOND CO.

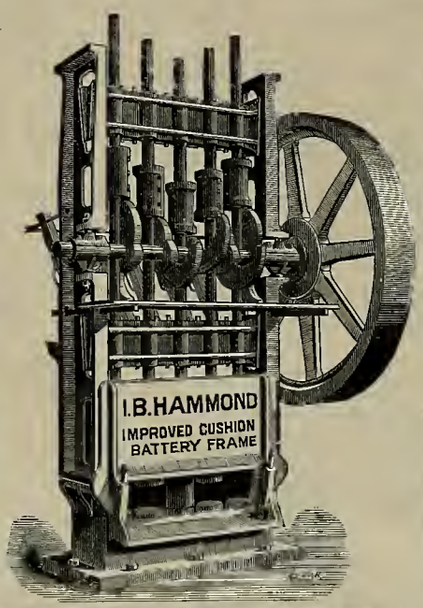
69 First Street, PORTLAND, OR.

MANUFACTURERS OF

Stamp Mills, Ore Feeders

DETACHABLE BUCKET WIRE-ROPE TRAMWAYS,

Roller Grinding Pans, Desulphurizing Furnaces, Etc.



Improved Self-Contained Cushion-Frame Five-Stamp Mill.

The Improved, Iron-Frame, Self-Contained, Cushion-Frame, Five-Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space. The term "Setf-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

FIRST: There is Saved by the Use of This Mill a Large Bill for Heavy Timbers, in Many Instances Obtained at Great Expense and Loss Of Time.

SECOND: The Saving in Mill-Wright and Mechanics' Labor in Framing and Erecting.

THIRD: The Large Amount of Space Saved.

We refer by permission to Mr. N. A. McMillan, Haines, Oregon, manager of the Blue Mountain Mining Co., at Rock Creek, Or., where ten of our stamp mills are in operation; also to Mr. John S. Miller, Helena, Montana, manager of the Diamond Hill Mining Co., operating one of our forty-stamp mills at their mines at Townsend, Montana.

Send for Catalogue and Price List.

CORRESPONDENCE SOLICITED.

THE OLD RELIABLE!



ALBANY

LUBRICATING COMPOUND

TWENTY-SEVEN YEARS' CONTINUOUS SERVICE in the great Mines, Steamships, Railroads and Mills all over the world prove it to be

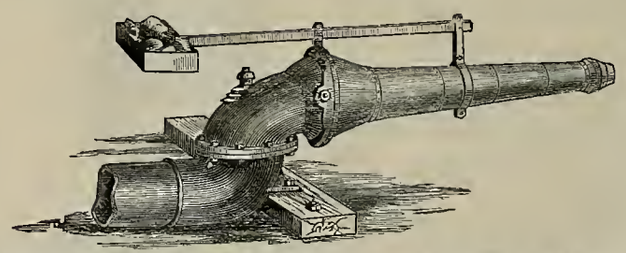
THE KING OF LUBRICANTS!

Tatum & Bowen

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DEALERS IN MACHINERY, OILS, MINING AND MILL SUPPLIES, ETC.

IMPROVED FORM OF HYDRAULIC GIANTS.



The above cut illustrates the IMPROVED FORM OF DOUBLE-JOINTED HYDRAULIC GIANTS which we manufacture, and which are pronounced far superior to the SINGLE-JOINTED style. The latter, however, we furnish when requested. Prices, Discounts and Catalogues of our specialties of Hydraulic Mining Machinery sent upon application.

JOSHUA HENDY MACHINE WORKS, 42 Fremont St., San Francisco.

The Russell Process.

For information concerning this process for the reduction of ores containing precious metals, and terms of license, apply to

THE RUSSELL PROCESS CO.,

Park City, Utah.

QUICKSILVER!

FOR SALE BY

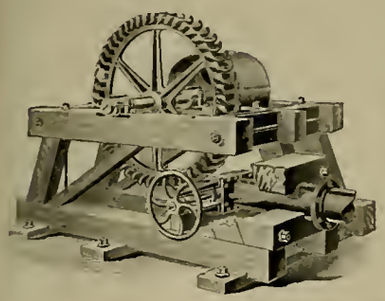
The Eureka Company,

OF SAN FRANCISCO.

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RISDON IRON WORKS.

OFFICE AND WORKS, COR. BEALE AND HOWARD STS., SAN FRANCISCO. CABLE ADDRESS, "RISDON'S," SAN FRANCISCO.



The above cut shows the general arrangement of one of Knight's Standard Water Wheels, of which there are more than 450 in use in California alone. These wheels are made from 2 feet to 6 feet in diameter, from 10 to 1000 horse power, and adapted to all heads and purposes.
Descriptive circulars mailed free on application.

— MANUFACTURERS OF —

JOHNSTON CONCENTRATORS,

IMPROVED BRYAN MILLS,

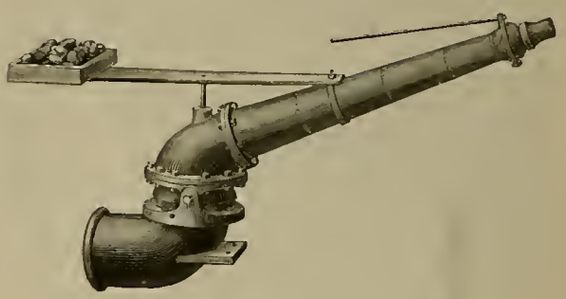
RISDON ORE FEEDERS, "Challenge" Type.

AIR COMPRESSORS,

MINING, MILLING, PUMPING AND HOISTING PLANTS,

GOLD AND SILVER STAMP MILLS.

CATALOGUES AND PRICES ON APPLICATION.



IMPROVED HYDRAULIC GIANT.

The above cut illustrates the improved form of Hydraulic Giants, in which the Center Bolt is dispensed with, which was so liable to catch trash.
Prices and catalogues of our specialties sent free on application.

The Edward P. Allis Company, Milwaukee, Wis.

Established 1860. Reliance Works.

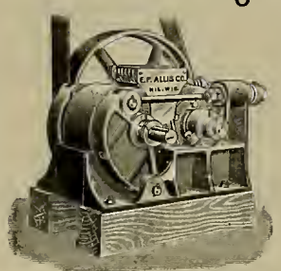
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Crushers, Rolls, Jigs, Concentrators, Screens, Stamps, Pumps, Compressors, Hoists, Boilers, Etc., Etc.

Reynolds Corliss Engines.

WORK THE BEST. PRICES THE LOWEST.

The Reliance Crushing Rolls.



The Best in the World.

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Chicago, Ill. ..... 509 Home Ins. Building.
Kansas City, Mo. ..... 43 Armour Building.
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City of Mexico ..... Calle Gante, No. 12.

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Rock Drilling, Air Compressing, Mining and Quarrying

Machinery.

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H. D. MORRIS & CO., Agents, 141 First St., San Francisco, Cal.

ADAMANTINE SHOES AND DIES

—AND—

CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.



STAMP SHOES.



These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for Illustrated Circular.

Manufactured by CHROME STEEL WORKS, Brooklyn, N. Y.

H. D. MORRIS & CO., Agents, 141 and 143 First Street, San Francisco.

Special attention given to the purchase of Mine and Mill Supplies.



Stamp Cam.

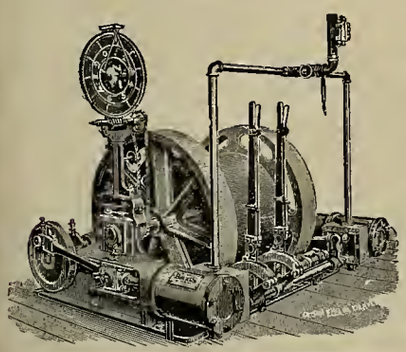
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MANHATTAN RUBBER BELTING, PACKING AND HOSE,
SANDERSON DRILL STEEL,
MORRIS CENTRIFUGAL PUMPS,
LIGHT STEEL RAIL.

Hendrie & Bolthoff Mfg. Co.,

DENVER, COLORADO.



LATEST IMPROVED

Patent Friction Hoisting ENGINES,

— WITH —

Automatic Alarm Bell and Indicator.

IMPROVED GOLD STAMP MILLS.

General Mining Machinery and Supplies.

DEWEY & CO., PATENT SOLICITORS.

220 Market St., San Francisco, Cal.

Mining Pipe!



STEEL OR IRON.—We make pipe of either, but recommend STEEL, it being superior to iron in many particulars and inferior in none.
COATING.—We use great care in COATING our pipe with a HOT solution of Doulie Refined Asphaltum and Maltha.
COMPETITORS.—Our competitors say we have the best appointed Pipe Shop on the Coast.

SCHAW, INGRAM, BATCHER & CO., Hardware Merchants,
SACRAMENTO, CAL.

MINE BELL SIGNALS.

Adopted, Used and In Force in Accordance with State Law.

FOR THE CONVENIENCE OF OUR READERS IN THE MINING COUNTIES WE PRINT IN legal size, 12x36 inches, the Mine Bell Signals and Rules provided for in the Voorhies Act, passed by the State Legislature and approved March 8, 1893. The law is entitled "An Act to Establish a Uniform System of Mine Bell Signals to Be Used in All Mines Operated in the State of California, for the Protection of Miners." We furnish these Signals and Rules, printed on cloth so as to withstand dampness, for 50 cents a copy. MINING AND SCIENTIFIC PRESS, 220 Market St., San Francisco.

Market Reports.

The Markets.

SAN FRANCISCO, Nov. 28, 1895.

But little could he said this week that was not a repetition of last week's remarks.

The railroad men are acting, according to the Chicago *Railway Review*, like our stock investors. It says: "The question agitating large buying interests in iron and steel is, How soon will prices reach the lower level to which they are drifting? Another question is, What will that level he? Ore has taken a stand at a point which large buyers refuse to contract. Steel buyers who must renew their contracts in Decemher are hoping that the bottom prices will he reached hy that time. The knowledge that large requiremcnts await filling and that manufacturers are anxious to cover the needs of 1896 as soon as possihle, gives the whole market an undertone of strength. Just now all markets are quiet, and hoth sides await developments."

A Pittshurg dispatch says an advance of 2 per cent in wages for steel and sheet-iron workers of all amalgamated mills in the country has heen granted by the manufacturers. It will affect about 12,000 workers.

New York Metal Market.

NEW YORK, Nov. 28.–PIG IRON—Southern, 12@13.00; Northern, 12@14.00.

COPPER — Brokers', 11c; exchange, 11.20c.

LEAD—Brokers', $3.15; exchange, $3.20.

TIN—Straits, 13.75@14.25c.

SPELTER—Domestic, $3.65.

New York Silver Prices.

NEW YORK, Nov. 28.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30¾	67¼	11 30	.....
Saturday	30¾	67⅜	11 25	3 10
Monday	30¾	67⅜	.....	3 15
Tuesday	30¾	67⅜	.....	.....
Wednesday	30¼	67	11 20	3 15
Thursday	Holiday		.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.88
London Merchants	$4.86½
London Sight Bankers	$4.89½
Refined Silver, per oz., 1000 fine	67¾c
Mexican Dollars	55c

San Francisco Metal Market.

COPPER.

Bolt	½ & 5-16, 20c; ¾ and larger, 21c		
Lake Superior Sheathing	22	@	—
Ingot, johning	—	@	18
Ingot, wholesale	17	@	1 .
Sheet copper	—	@	21

ZINC.

Sheet	9½@		

LEAD.

Pig	—	@	3 90
Bar	—	@	4 00
Sheet	—	@	5 25
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes,	"	"	1 45
Buck, Balls and Chilled, do,	"	"	1 45

IRON.

American Soft	16 00	@	18 00
Pig, per ton	18 00	@	20 00

STEEL.

English, lb	16	@	19

ANTIMONY.

Per lb	—	@	10½

PIG TIN.

Per lb	15	@	16 00

QUICKSILVER.

Home trade, per flask	39 00	@	40 —

BORAX.

Refined, in car lots	—	@	5½
Refined, in sacks and barrels	—	@	5⅝
Powdered, in car lots	—	@	5⅝
Concentrated, "	—	@	4⅞

TIN PLATE.

Per bx	5 25	@	6 00

ZINC.

Sheet	8½@		

NAILS.

Wire			$3 50
Cut			3 25

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

San Francisco Stock Board Sales.

SAN FRANCISCO, Nov. 28, 1895.

9:30 A. M. SESSION.

600	Alpha	37	650	Occidental	1 15
300	Alta	17	50		1 20
250	Belcher	29	500	Potosi	65
300	Best & Belcher	69	250		64
100	Bullion	12	250	Overman	14
200	Challenge	30	600	Savage	44
100		29	100		45
750	C. C. & Va	2 30	100	S B & M	12
100	Confidence	90	200	Sierra Nevada	66
100	Con. Imperial	04	200		67
250	Gould & Curry	34	100	Union	59
100	Mexican	44	100		58
100		43	200	Yellow Jacket	23
300	Ophir	1 30			

SECOND SESSION—2:30 P. M.

400	Ophir	1 15	100	Crown Point	29
500	Mexican	44	100		30
150		40	200	Yellow Jacket	24
600	Gould & Curry	32	200		25
100	Best & Belcher	65	2100	Alpha Con	37
500		66	200		38
400		64	100	Confidence	85
100		63	400	Sierra Nevada	65
100	Con Cal & Va	2 20	100	Overman	13
250		2 25	100	Justice	07
1000	Potosi	62	400	Union	55
800	Savage	43	200		54
400		44	600	Alta	19
100	Chollar	28	1600	Occidental	1 05
900	H. & N	1 15	1600		1 10
100		1 20			

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Best & Belcher M Co, Nev	59	25c	Nov 4,	Dec 9, Dec 30	M Jaffe, 309 Montgomery
Bullion M Co, Nev	46	10c	Nov 4,	Dec 9, Dec 30	R R Grayson, 331 Pine
Bulwer Con M Co, Cal	11	5c	Oct 29,	Dec 4, Dec 31	C E Elliot, 309 Montgomery
Con Cal & Va M Co, Nev	5	25c	Nov 22,	Dec 28, Jan 16	A W Havens, 309 Montgomery
Confidence M Co, Nev	26	30c	Nov 13,	Dec 18, Jan 8	A S Groth, 414 California
Chollar M Co, Nev	41	25c	Nov 12,	Dec 17, Jan 7	C E Elliot, 309 Montgomery
Exchequer M Co, Nev	38	5c	Oct 21,	Nov 25, Dec 19	C E Elliot, 309 Montgomery
Gold Bar Con M Co, Cal	2	3c	Nov 5,	Dec 21, Jan 16	E C Godfrey, Crocker Building
Gould & Curry S M Co, Nev	77	15c	Nov 5,	Dec 10, Dec 30	A K Durbrow, 309 Montgomery
Iowa Mining Co, Nev	21	5c	Oct 23,	Nov 26, Dec 16	R L Thomas, 419 California
Jamison M Co, Cal	7	2c	Nov 9,	Dec 16, Jan 6	S W Cheyney, 120 Sutter
Marguerite M Co, Cal	1	10c	Nov 2,	Dec 9, Jan 5	Chas. Winters, 237 12th St., S F
Mexican M Co, Nev	53	25c	Nov 19,	Dec 23, Jan 14	C E Elliot, 309 Montgomery
Ophir S M Co, Nev,	67	25c	Nov 5,	Dec 9, Dec 30	E B Holmes, 309 Montgomery
Superior M & M Co, Cal	1	5c	Nov 5,	Dec 9, Dec 30	J Howard Baruard, 916 Market, S F
Yellow Jacket M Co, Nev	60	25c	Nov 12,	Dec 17, Jan 22	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date
Mexican M Co, Nev	C E Elliot, 309 Montgomery	Dec 3
Gould & Curry S M Co, Nev	A K Durbrow, 309 Montgomery	Dec 16

Mining Share Market.

SAN FRANCISCO, Nov. 28, 1895.

In years gone hy, when the late Senator Fair was credited with the manipulation and Occidental — commonly called "Ox" —was brought to the front as the leader, it was considered the forerunner of more activity in the share market. Who has heen instrumental in the hringing of Occidental to the front this week is not known, and no one seems to care so long as there is more activity. The advance in the shares of this mine to over 400 per cent within a few days, with quick turns in the up-move, has brought about an improved tone and a more huoyant feeling throughout the list. Trading, so far, appears to he confined largely to chronic dealers, who are encouraged hy cross-orders and other well-known methods pursued hy manipulators to hring about higher prices. Those in position to form opinions worthy of consideration do not encourage the helief to hope for a continuance on the up-grade longer than one or more weeks, hut even this is, if it does not collapse sooner, cause for congratulation. They think that the development made in Occidental does not justify good prices as a husiness proposition, unless a further improvement continues; hut, as a gamhle, of course they are not in position to pass judgment. Probahly this opinion is grounded largely on past experience and not on what might take place with money-eyed backing to the proposition. As yet, nothing has appeared in the manipulation to warrant asserting that it is more than what has heen witnessed in the market for several years past. It looks very much as if Occidental is heing used as was Confidence a short time ago, which, after selling a line of shares and making shorts fill, was hroke back and the entire list sent down to low prices again. If this should prove true in the present, then the hulls will be as hadly hurt as the hears are heing squeezed now.

News from the Comstock mines is essentially unchanged, although as work progresses in several there are more encouraging features in one or two mines in each group. That this encouragement seems to he genuine, is witnessed in the activity given the past week to the Occidental shares. As this mine is situated on the Brunswick lode, the manipulators can make it a leader so as to attract attention from the Comstock mines, and when the object is accomplished, drive it down, carrying the entire list to much lower prices. The work heing done in the Alta group is quite important, particularly in Alta, where it is in the direction calculated to develop more high-grade ore of larger size. In the Gold Hill group there is said to be work under way, which is reported in such a way as not to attract the cupidity of the puhlic. Probahly this is a correct way, and doubtless is, from the fact that outside traders in shares rush in as huyers on the least favorahle showing, only to he swamped hy a break when the showing does not materialize into anything which justifies moneyed men to work it up, thus exemplifying the old saying that fools rush in where angels fear to tread. The work in this group is largely towards the west. In the middle group they continue to follow up streaks and small veins in the hope of their leading up to something of importance. In doing this they extract some ore. The work in this group is towards striking the west lode. The long west drifts in Bullion and Gould & Curry are heing pushed as fast as can he under the many disadvantages which are natural to look for under this kind of work. In Con. Virginia the work is to develop the 1000-foot level and also to get the levels at around the water levels into hetter condition. They may find it necessary later on to pump this mine out, as for that, the entire lode out for working helow the Comstock tunnel level. In Ophir and Mexican the upper levels are given attentiou, hut at the same time the work around the 1465-foot level is not neglected, yet much time will have to he consumed before results can he known. In Union and Sierra Nevada the work is heing slowly watched, with the hope that mining mens' expectation will he realized in striking something more than assessments.

The Brunswick lode is attracting renewed attention owing to favorahle reports from Occidental. The strike in the latter, which is quite important, is not sufficiently developed to justify uudue excitement in the shares; although the present showing is enough to warrant a gamhle, hut not an investment, for any day they are liable to run out of ore. It will take time to show what it is worth. Too many good showings on the Comstock lode have heen made which did not materialize to tempt moneyed mining men to huying shares for holding, hut these showings were sufficient to euable a few outside men to make a false move on the up grade, only to he followed hy a collapse, with dire results to others who hought in expectation of a large development and big deal. The other mines on the Brunswick lode are pushing exploiting work, with the hopes of finding ore of some importance. This lode will hear watching, hut for how long is, as yet, an open question.

From the outside mines there is nothing coming to hand to excite attention, although in the Bodie district the groundwork is heing laid for more extensive working in 1896; yet there can he no question that it will have to he extended to lower levels to develop anything more than assessments. Time will he required for the purpose of working lower.

Taking the situation on the different lodes as a whole, there is much encouragement to look forward to for good things in the future, hut at present it does not warrant venturing in on a legitimate investment proposition. No one can tell what will he revealed by work, even one day in advance.

The following illustrates the changes of the week:

Mines.	Nov. 21.	Nov. 28.
Alpha	$ 27	$ 38
Alta Consolidated	09	19
Andes	.....	.....
Belcher	26	29
Best & Belcher	54	69
Bodie	34	.....
Bullion	05	12
Challenge	25	30
Chollar	.....	28
Confidence	80	90
Consolidated California and Virginia	2 10	2 30
Consolidated New York	.....	.....
Crown Point	.....	30
Exchequer	.....	.....
Gould & Curry	25	34
Hale & Norcross	1 20	1 20
Justice	.....	07
Mexican	37	44
Ophir	1 10	1 20
Overman	00	14
Potosi	44	65
Savage	32	45
Sierra Nevada	57	67
Union	45	59
Utah	.....	.....
Yellow Jacket	21	25

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	467	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	502	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	37	3 70
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	554	55 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4,000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, Cal.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on November 2, 1895, the above sale is postponed to MONDAY, the 2d day of December, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

Assessment Notices.

BULLION MINING COMPANY. — Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of November, 1895, an assessment (No. 46) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 20, No. 331 Pine street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made be before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office—Room 20, No. 331 Pine street, San Francisco, California.

SUPERIOR MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Placerville, El Dorado county, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the fifth day of November, 1895, an assessment (No. 1) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 916 Market street, Room 81, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on WEDNESDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. HOWARD BARNARD, Secretary.

Office—Room 81, 916 Market street, San Francisco, California.

MARGUERITE GOLD MINING AND MILLING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Auburn, Placer county, California.

Notice is hereby given, that at a meetiug of the Board of Directors, held on the second day of November, 1895, an assessment (No. 1) of 10 cents per share was levied upon the whole of the capital stock of the corporatiou, payable immediately in United States gold coin, to the secretary, at the office of the company, 237 Twelfth street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the second day of December, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before will be sold on MONDAY, the fifth day of January, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

CHAS. WINTERS, Secretary.

Office—237 Twelfth street, San Francisco, California. Office hours from 4 to 6 o'clock P. M. Bring your certificate.

THE JAMISON MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, on Jamison Creek, near Johnsville, Plumas County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the ninth day of November, 1895, an assessment (No. 7) of two cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 120 Sutter street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of December, 1895, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on MONDAY, the 6th day of January, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

SAM W. CHEYNEY, Secretary.

Office—Room 50, 120 Sutter street, San Francisco, California.

GOLD BAR CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 5th day of November, 1895, an assessment (No. 2), of three cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Rooms 37 and 38, Crocker Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of December, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on THURSDAY, the 16th day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. C. GODFREY, Secretary.

Office—37 and 38 Crocker Building, San Francisco, California.

GOULD & CURRY SILVER MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1895, an assessment (No. 77) of Fifteen (15) Cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of December, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

CON. CALIFORNIA & VIRGINIA MINING COMPANY. — Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the 22d day of November, 1895, an assessment (No. 5) of twenty-five (25) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of December, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on THURSDAY, the sixteenth (16th) day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. W. HAVENS, Secretary.

Office—Room 48, Nevada Block, No. 309 Montgomery street, San Francisco, Cal fornia.

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Assessment Notices.

BEST & BELCHER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the fourth (4th) day of November, 1895, an assessment (No. 20) of twenty-five cents (25 cents) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the ninth (9th) day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

M. JAFFE, Secretary.

Office—Room 33, Nevada Block, No. 309 Montgomery street San Francisco, California.

CONFIDENCE SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 13th day of November, 1895, an assessment (No. 26) of 30 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, No. 414 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of December, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on WEDNESDAY, the 8th day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

A. S. GROTH, Secretary.

Office—No. 414 California street, San Francisco, California.

ANNUAL MEETING.—THE REGULAR ANNUAL MEETING of the stockholders of the Gould & Curry Silver Mining Company will be held at the office of the company, room 69, Nevada Block, 309 Montgomery street, San Francisco, California, on MONDAY, the 16th day of December, 1895, at the hour of one o'clock, P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, December 13, 1895, at 3 o'clock P. M.

ALFRED K. DURBROW, Secretary.



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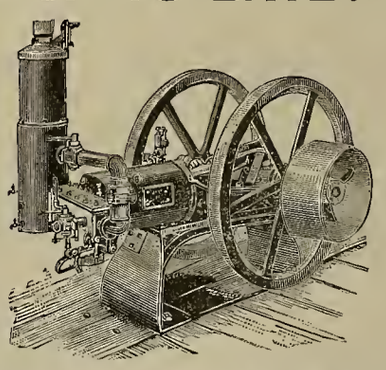
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Coal Gas, ten hours' run, 1000 feet	$2 00
Gasoline (74 deg.), ten hours' run, 8¾ gallons @ 14c	1 25
Coal Oil, ten hours' run, 7½ gallons @ 10c	75
Crude Petroleum, asphaltum base, 16 gallons @ 3c	48
Crude Petroleum (36 deg.), paraffine base, 13 gallons @ 5c	65

On the crude petroleum with asphaltum base we had an over-product of 7 gallons of asphaltum; the market price is 3 cents per gallon—21 cents. This deducted from the first cost of the crude petroleum for ten hours' run leaves a net balance of 27 cents. And from the crude oil with a paraffine base we had an over-product of 8 gallons of good lubricating oil, which we consider equal to any we have ever used, but will estimate its value conservatively at 20 cents per gallon, making 60 cents; this deducted from the first cost of the crude oil leaves a balance of 5 cents, total cost of running ten hours.

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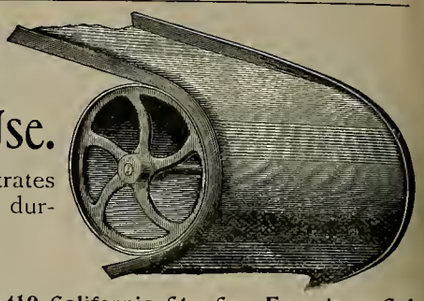
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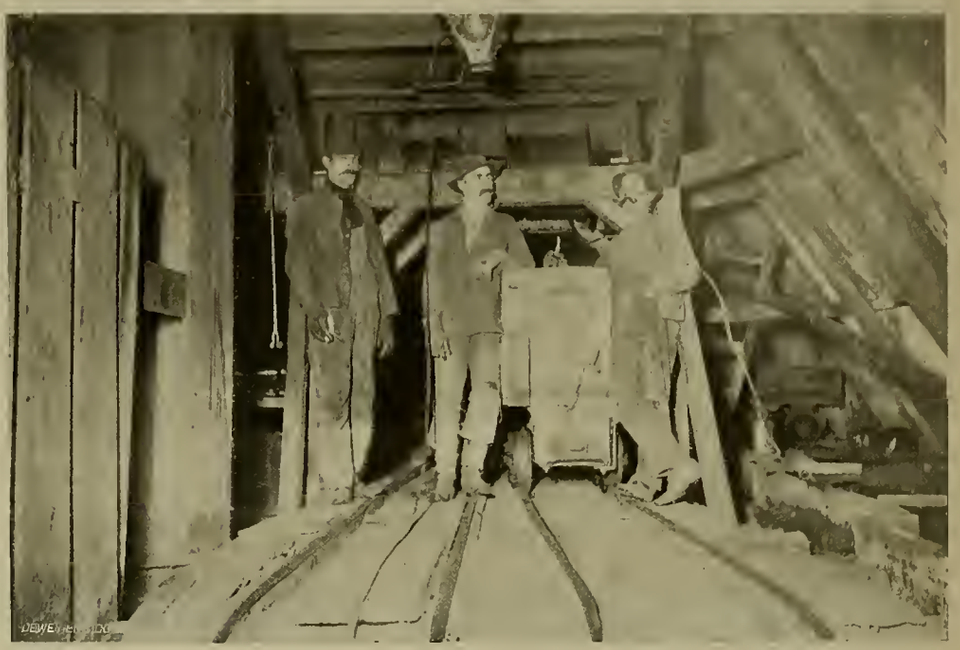
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Gasoline Engines in Mines.

This motive power has done much in developing many properties that otherwise would have remained non-paying investments; investigation shows that the gasoline engine has met with favor among mining men wherever used. A representative of this journal lately visited the Pioneer gravel mine at Grass Flat, Sierra county, where they have been using an engine of this description since April, 1893, when they put in the first plant, consisting of a 12 H. P. Union gas engine and hoist, manufactured by the Union Gas Engine Company of San Francisco. This engine also drives a Jackhead pump for pumping from sump. This plant is located in the mine a distance of 1400 feet from mouth of tunnel, and at head of incline; the incline is 150 feet long, with a fall of one foot in four.

Reference to the upper cut will show top of incline, also double drum hoist and frame. As will be seen, the track on incline is double and the hoist is so arranged that one loaded car is hoisted and one empty car lowered at the same time. The cars carry about 3500 pounds of gravel, and are raised at a speed of 150 feet per minute. About 350 carloads are raised every twenty-four hours. The lower cut shows engine to right of tunnel (going in) setting in such position as to have drums of hoist, to which it is directly connected, come in line with the double track. The exhaust of engine is carried into the air shaft and is piped directly to surface, a vertical distance of 230 feet. This prevents any fumes being returned to mine to vitiate the air, and a person going through the mine would never suspect that there was any motive power used, until he came upon it, for it runs noiselessly and gives out no odor, there being nothing to indicate its presence until it meets the view. The pump used in connection with this engine has a 6000-gallon capacity per hour, and is driven from a countershaft at the head of the incline. This pump met all requirements until last winter, when it was found that the mine was making so much water that the pump could not take care of it. An order was immediately sent to the same company for another plant, consisting of an 8 H. P. engine and a No. 3 centrifugal pump with a capacity of 21,000 gallons per hour. This plant is situated midway of incline, to left of same going down. The pump is placed a few feet above sump, and the discharge pipe runs over top of incline and into flume in tunnel. At one time it was found necessary to run this plant for twenty-one consecutive days, and the mine men say during that time the engine never faltered.



HEAD OF INCLINE PIONEER GRAVEL MINE.

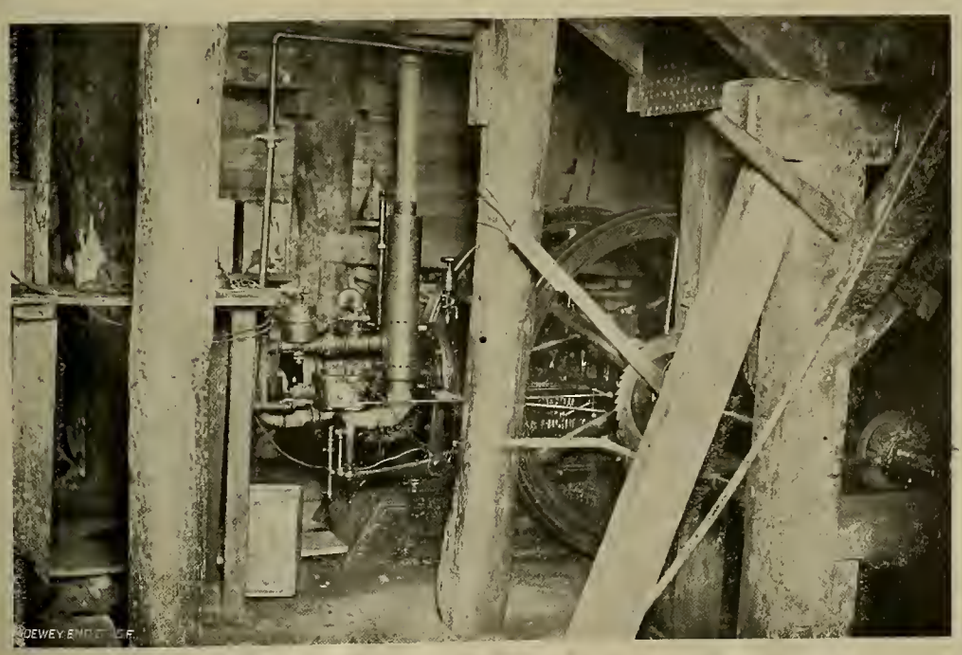
The company recently ordered another engine of 15 H. P., to be used for hoisting in the new tunnel now under construction. Mr. Deisem, superintendent of the mine, in speaking of the engines, says that he is satisfied with the motive power for underground work.

The Sterling Mining and Milling Company are mining in Nye county, Nevada, where wood and water are entirely out of the question, consequently they concluded to try the gasoline engine. They purchased from the Union Gas Engine Company one 25 H. P. engine, and used it to run a rotary mill at one of their mines. After testing it for sufficient time to ascertain to their satisfaction the practicability of this form of motive power, they gave an order for three engines of 50, 25 and 50 H. P. respectively.

The Pacific Coast Borax Company have had one of these engines in operation since February, 1891. This engine has been in constant use since that date. It is used for hoisting at the mine in Death valley. Previous to the installation of this engine the company was obliged to do their hoisting by mule power, and owing to the scarcity of water in that section the water for the mule power had to be hauled a distance of forty miles. A gasoline hoisting plant was supplied with a small tank of water, which was used for cooling the cylinder. This was circulated or used over and over, and the only loss was from evaporation, which was made up by the addition of a few gallons each week. This engine was so satisfactory that the Borax Company gave an order for another hoisting plant in August, this year.

The Keystone Mining Company at Keystone, Nevada, also have a hoisting plant of 12 H. P., which has been in operation for the past three years. The books of the Union Gas Engine Company show that there has only been an expenditure of $2 for repairs on their engine since it was started.

On page 373 of this issue will be found an engraving of the 8 H. P. engine referred to in position in the Pioneer gravel mine, Sierra Co.



TWELVE HORSE POWER HOISTING PLANT, 1400 FEET FROM MOUTH OF TUNNEL.

MINING AND SCIENTIFIC PRESS.

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J. F. HALLORAN.....General Manager

San Francisco, December 7, 1895.

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CONGRESS convened last Monday. Report is made that a bill will be immediately introduced suspending, indefinitely, the statute requiring annual assessment work on unpatented claims. This is hardly credible: it would be a mistake and an injustice not possible of consummation to have such a measure apply to '95 and an injury to the best interests of the mining world to attempt such legislation for '96. The suspension of assessments in '93 and '94 did not do any material good and a repetition of such enactment would be unwise. In general, the holder or holders of a claim should either work it or let go, and the present law is lenient enough without any abrogation of its exceedingly light requirements.

COMMENTING on the tables of gold yield of the State by counties, as published herein on the 23rd ult., the Nevada *Transcript*, speaking for Nevada county, says that if the gold producers of that county complied with official requests and reported the yield, the aggregate credited to that county would be more, which is believed to be true. Regarding Tuolumne county, the *Banner* says: "The falling off in Tuolumne from the figures of 1892 is undoubtedly due to a large extent to the cessation of pocket mining, and the turning of the miners to the opening up and developing of permanent quartz leads which have only commenced to show their rich deposits since the beginning of 1895. This year's output will show Tuolumne far in the lead as a gold-producing county when the figures are footed up."

CONSIDERABLE now being published in the daily papers and elsewhere about big strikes and wonderful discoveries needs to be discounted. Hard times have sent many from other pursuits to the only present paying industry in California, and the season for deferred annual assessment work sends out many more. Considerable ground is being worked, and many promising developments made, but the wonderful stories in the morning columns are mostly exaggerations. Of such a nature is that one from Barstow, and the new camp thirty miles from there, where "the ore runs from $40 to $200:" "some of it is worth a dollar a pound:" "at the bottom of a 22-foot shaft a three-foot ledge averages $200." These are not intentional lies. Probably the correspondent believed what he sends; but such stuff hurts the region from which it emanates To any one who has ever been anywhere near Barstow the thing is ludicrous, but not more so than many similar statements from more promising localities.

Assessment Work.

The suspension of assessment work during the past two years, coupled with the statements published by the newspapers of the State of what constitutes assessment work, has so confused the miners that many of them are at a loss to know "where they are at." It is held that the law allows $5 a day for assessment work; that a ten-foot shaft, cut or drift is all that is required; that on placer ground only half the amount, or $50, in work is required on each claim of twenty acres; that if the miner's placer mine is but ten acres only one-half of the full amount need be done; that a claim can be held by "resuming work" on the 31st of December and continuing it on the 1st of January; that a company owning a number of claims, all adjoining, by working steadily on one of them before and after January 1st, can so hold the whole of them, even if the amount of work done on the 1st of January does not equal $100 on each claim. Now, these opinions are not gathered from the prospector alone, but are in good part those of leading mining operators. In this situation, the PRESS will do the average miner a great favor if at this time it will publish the full text of the law in relation to assessment work in California, on both gravel and quartz. I have discussed and had the subject "cussed" so often of late, and each time have agreed to refer the matter to you for final opinion, which please give through the PRESS and oblige the miners.

In answer to the above, received this week from Murphys, Calaveras Co., there is no provision in the Federal or California State law which allows any certain sum a day as a proper charge in estimating the value of the annual assessment work of one hundred dollars upon any mining claim. The rate of daily wages which are paid to miners at or in the vicinity of the claim upon which the work is done, is the proper basis for such computation: if the prevailing rate of wages is $2.50 a day, the equivalent of forty days labor should be performed; if the pay is $5 a day, then twenty days labor, by one man, would be in full compliance with the statute. Therefore, a ten-foot shaft, cut or drift would not be sufficient unless such work cost the claimant at least $10 a foot, or $100 in all. It makes no difference in this respect whether the claim is a lode or placer claim, or is full size or not: that is, if it does not happen to reach the maximum limit allowed by the law, for the same amount of assessment work—to wit, $100—must be done. It is, therefore, a mistake to suppose that if a placer claim contains only ten acres, whereas twenty acres are allowed to each locator, that $50 or anything less than $100 worth of work is sufficient to hold the claim. But this statement as to labor must be taken with this qualification, viz.: that all proper and necessary expenditures, such as necessary timbering and blacksmith charges, and the cost of powder, caps and fuse, and similar necessary expenditures, may be credited as part of the assessment work and proportionately reduce the number of days of labor or number of workmen employed.

If the locator, after the time for such expenditure has elapsed, but before third party's rights have intervened, resumes work and continues until the necessary amount is expended, his right is revived and relates back to the original location.

Consequently, a mining claim is not open to relocation on the first day of January succeeding the year in which the expenditures are required if work has been resumed by the proper party on the 31st day of the preceding December. But the work when resumed must be continued until the required amount is performed; otherwise the claim will become subject to relocation. To resume work on the 31st of December of the assessment year and to follow it up with several days work in the succeeding January, with say only one workman, or other inadequate expenditure, would not be sufficient to hold the claim against relocation after such suspension.

It is error to assume that a failure to file the affidavit of annual work under the California statute of 1891 works a forfeiture of the claimant's right and subjects the claim to relocation. That statute provides for nothing of the kind, and if it did do so it would be inoperative to that extent, because it would be in conflict with the paramount law—that is, the law of Congress upon the same subject. This latter law is silent as to how the fact of this performance of labor or improvements may be evidenced. The only advantage to be gained by filing this affidavit is that it affords *prima facie* evidence that the work has been done.

Briefly, then, if the required work has been done upon a mining claim it is not open to relocation, because an affidavit to that effect has not been filed with the proper County Recorder under the State law of 1891. The essential thing is the performance of the labor, not the making and filing of an affidavit that it has been done.

A company or individual holding a number of adjoining claims—that is, where contiguous locations are held as a joint claim—can do all the required annual assessment work upon any one of the locations to the aggregate amount of what the law would require on all the locations were they segregated, if it can be shown that each and all of those claims were benefited by such work done. That work or improvement must look to and have direct bearing on the development or working of the mine. The Federal Statutes state that such work may be performed by the original locators, their heirs, assigns or legal representatives. If the spirit of the Statutes on these matters is complied with, the interpretation is given construction most favorable to the miner; but evasion or delay may occasion him serious trouble.

A MINING "BOOM" is reported from Cripple Creek, Colorado's most promising gold locality, and the incorporation of new mining companies goes on at such a rate as to entail the employment of additional help in the office of the county clerk of El Paso Co. Cripple Creek is undoubtedly a good gold district. Some of the announcements by some of the Eastern financial journals are, however, slightly at variance with the truth. It is not the desire of the MINING AND SCIENTIFIC PRESS to spoil speculation if the New York or Chicago or Denver speculators are so minded; but since some of them see fit to attempt invidious comparisons between Colorado and California, and attempt undue laudation by misstatement, it is in order to state that one mine in one county in California—the Utica, Calaveras county—has been for some time producing more gold than all the mines in Cripple Creek district put together. "There are others."

OREGON mining papers agree that $2,000,000 will fairly represent that State's gold output for '95. The gold yield of any State is very difficult to correctly approximate, especially where, as in Oregon, there is no procurable data. Even in this State, with its admirable organization, mint statistics, express returns and commercial data, accuracy for such figures is not wholly to be secured. It is only by pledges that names or localities will not be divulged that most mine owners will give the returns from their properties, and too large a percentage of the blanks sent out are never filled up or returned. The pledges given are never violated, but it is only natural for individuals to hesitate giving the amount of gold yield. If the promised mining activity in Oregon comes to pass, that commonwealth will increase its gold yield in '96 fifty per cent over that of '95.

APART from any participation in the present discussion between the *Chronicle* and the *Examiner*, as to the relative or absolute circulation of those able journals, it is deemed worthy of note that twice in the past month the San Francisco News Co. has increased its order for the number of copies of the MINING AND SCIENTIFIC PRESS, weekly delivered to it, that concern having charge of the transient sales of this journal. This, in connection with the daily addition of so many new names to our subscription lists, goes far to justify the belief that, in addition to the fact that this is the oldest mining paper on the continent, it is the most widely read: so many of our old subscribers say in renewing that "it is the best," that without any attempt at self-praise, it is in order to quote the proverb that "what everybody says must be so."

CONSIDERABLE bonding of mining properties is going on. 'Tis a good thing, but can be overdone. Where the bonder means business and goes ahead developing the property the result is mutually beneficial; where the property is bonded in the hope of disposing of it to some one else before the bond expires the result is often unsatisfactory all round. Too many are willing to look upon a bond as a mere option, a "call" on the property for a certain time. The man who bonds should be able to show ability to develop, and failure to successfully establish such financial ability should debar him from the pernicious privilege of simply tying up a good property and spoiling its sale to some one else who means business. There is an element of risk in bonding mining property that must be reckoned. The remedy for

the abuse of the custom of bonding lies largely with the owner. If he insist upon due development and declines to entertain any proposition which leaves that out or in doubt, he will benefit himself and the district in which his claim is located.

A NOTICEABLE FEATURE of many of the new mining companies now being incorporated is the enormous figure of nominal capitalization—$1,000,000; $5,000,000; $10,000,000. Nothing is made and much lost by such fictitious and misleading starts. Montana has made a sensible law authorizing official incorporation fees proportionate to the amount of capital stock named, and it is noticeable that there the capital stock named in articles of incorporation is more in accordance with prospects and requirements. It is ridiculous to read, as one so often does, that "The Golden Lyre Co. has organized; capital stock, $5,000,000; amount subscribed, $100." It is not invariably the case that a new company is not justified in using seven figures in its stated capitalization, but when such a capital is named, its justification is usually found in the names of the subscribers and directors of the company.

THE argument so often used in communications to this journal against the California plan of assessing stock in a mining company is not confirmed by present Colorado experience, where, it is claimed, the progress of Leadville and other districts is impeded by the non-assessable plan of incorporation, even where the properties have been productive; they ceasing to be active when dividends ceased, there being no way to compel payment under penalty of having the stock sold. While objection may justly be made to the abuse of the principle, it is believed that the California custom of making mining stock assessable, and compelling the shareholder to either pay his assessment or lose his stock, is more conducive to the continued working of the mine—and the shareholder—than the Colorado plan as formerly practiced at Leadville.

THE London *Mining Journal* of the 2d inst. contains an illustrated account of the ceremony of cutting the first sod of the new shaft at Dolcoath tin mine in Cornwall, England, which took place on the 26th inst. The shaft is to be sunk perpendicularly for a depth of 500 fathoms. It will occupy four years in construction, and will cost £30,000. The reorganization of this company, and the beginning of work on a new basis, mark a change in Cornish mining methods, and the example of the Colcoath may be followed by other Cornish companies.

Concentrates.

NEVADA COUNTY blacksmiths are going to form a union.

EVERY hydraulic miner in southern Oregon is praying for a wet winter.

MERCUR, Utah, gold fields are to be prospected with diamond drills.

NEARLY 500 miners are at present working in the Mercur, Utah, district.

THE Maud Hydraulic Co., B. C., has sold its properties to C. F. Fishback of Seattle.

THE Sunrise mill at Kelsey, El Dorado Co., is finished and has begun operations.

ONE-THIRD of the workmen at the Bullion-Beck, Utah, mine have been discharged.

DENVER miners say Colorado's mining sensation of '96 will center in Summit county.

MINT SUPERINTENDENT DAGGETT'S Santa Rosalia mine shows a net monthly profit of $4500.

"WHAT is a wildcat mine?" is being discussed in Colorado's nine mining stock exchanges.

SUPT. NICHOLS says the capacity of the DeLamar, Nev., mill is to be increased to 150 tons per day.

THE Hunter and Morning mines in the Cœur d'Alenes, Idaho, have plenty of water again and are in full operation.

SILVER PEAK, Nevada, is overcoming its financial difficulty: one-half the company's debts were paid last week, and assurances given of final settlement.

WORK is to be resumed on the Pauper, one of the old-time bonanzas of War Eagle, near Silver City, Idaho. It was closed down just twenty years ago.

AUTHENTIC bullion shipment statistics are of value to the county or district sending them and benefit any region more than any other kind of mining news.

THE present rule of the London Mining Stock Exchange is that when application is made to quote a mine one-fourth of the total capital shall be represented in solid cash.

MR. SCHNABLE has taken charge of the Good Hope placer properties at Sawpit and Richmond Hill, Plumas county. A restraining dam has been completed in Onion Valley creek.

FROM everywhere come reports of new discoveries and "rich strikes," the great majority of which are the natural result of the great amount of assessment work now in progress.

PROSPECTORS are reported staking out claims on the Colville, Wash., Indian reservation. The reservation will doubtless soon be thrown open, but any present selections would be premature.

THE Mono Mining and Milling Co. has incorporated here. The articles of incorporation say the "capital stock is ten million dollars," though the amount subscribed may be slightly shy.

THE deferred action of the Executive Committee of the California Miners' Association has been further postponed, awaiting the action of the Southern Pacific Company, to which the matter was recently referred.

THE Witwatersrand, South Africa, gold output for October was 192,652 ounces, 2,112 ounces less than that of September and 10,921 ounces less than the August yield, but 19,274 ounces more than the output of October, '94.

THE California & Sonora Gold Mining Co. has incorporated; capital stock, $100,000—$51,000 subscribed; directors, J. C. Jens, A. Reed, T. Frolich, H. J. Cortsen, T. P. Meighan; object, to work gravel deposits in Sonora, Mexico.

THE Mineral Transportation and Mining Company incorporated in this city last Wednesday. J. T. Davis, H. M. Rutherford, W. H. Pettis, E. A. Armsby, H. W. Snow are directors: capital stock, $10,000,000; $6000 subscribed.

ACCORDING to the London *Economist*, the decline in the Kaffir gold market valuation from the first part of September to November 11th was from $1,076,863,120 to $717,994,125, a fall of $358,868,995, or about 33⅓ per cent in about sixty days.

STIMULATED by the example of Denver and Pueblo, Colo., Spokane, Wash., calls for the establishment of a mining stock exchange. Those exchanges are all right, when rightly managed, but, wrongly managed, they will hurt their locality.

SALES of mining stock at the regular sessions of the San Francisco Stock and Exchange Board for November were 352,675, making a total for the eleven months of '95 of 2,869,655 shares, against 3,722,065 shares during the same period last year.

IN the Argonaut-Kennedy case at Jackson, Amador Co., the former company has secured a restraining order from working in the disputed ground. Argument on the asked-for injunction will be made next Monday before Judge McKenna in this city.

LAST week the "Kimball-Magneto-Electro-Prospecting and Developing Co." incorporated in this city; capital stock, $500,000. The "Alaska Mining and Shipping Co., capital stock $5,000,000," also announces San Francisco as its principal place of business.

AT the Broken Hill Proprietary, Australia, during the week ending Nov. 21st, 6097 tons of ore were treated, yielding 483 tons of lead, containing 140,655 ounces silver; also 163 tons treated by amalgamating and leaching plants, producing 9932 ounces silver.

THE Calumet and Hecla Copper Mining Co. of Michigan will pay a dividend of $5 per share on the 18th, the fourth of like amount declared this year, and each of these amounts to $500,000, making a total of $44,450,000. The company recently increased its output to 9,000,000 pounds per month.

THE Dunsmuir *News* says the Iron Mountain Mining Company have guards stationed all over the hills to keep their men from going to the saloons, which are all outside of the dead-line; and if a workman crosses the line he is discharged, divested of his number and cannot come into camp.

A MANCHESTER, N. H., JOURNAL says the Whitney Sodium Co. has incorporated there: capital stock, $75,000: to manufacture "an oxide of sodium for amalgamating zinc and gold plates. It is easily adapted for use in both placer and quartz gold working and is to save a larger proportion of float gold than it is now possible to do."

THE Hale & Norcross case is still in court. Last week Secretary A. B. Thompson produced his books to show that the bullion received by the Nevada Mill & Mining Co. was worth $1,678,900, of which $718,344.12 was in gold and $960,576.64 was in silver. The loss by discount on silver was $250,834.16. The case comes up again next Monday.

IN the case of the United States vs. D. Ross and the Copper Queen Mining Co., begun five years ago, involving $183,000 claimed by the Government for timber alleged to have been cut on non-mineral land in Cochise Co., Arizona, the jury stood 9 to 3 and was discharged. The case comes up again in the Federal Court next February.

THE terms wet and dry ores are often confused. Generally speaking, a wet ore is one that has a high percentage of lead or copper, say 40 per cent and upward of lead and 20 per cent in copper; but ores that contain no lead or copper, or less than 5 per cent of either of these metals, are dry ores. Smelters do not pay for less than 5 per cent of lead, so if there is any line of demarcation it is at this point.

LAST WEDNESDAY the Supreme Court of the United States decided the case of B. Healy, involving the price of lands on alternate sections within railroad land grants, entered under the desert land laws. The court held that the laws providing a price of $2.50 per acre in such cases had not been repealed by the timber-culture act, as was claimed, and that $2.50 was, under the law, the correct charge on entries within land grants.

UTAH mining men have a particular interest in the admission of that territory to statehood, since the new constitution provides that mining properties and revenues shall be taxed. The properties are to be taxed at the price paid the Government for the surface ground. A source of greater revenue will be the tax upon the "net annual proceeds" of the mines, roughly estimated to aggregate two and a half millions at present.

CHRONICLING the sale of some recently acquired "agricultural" land, for a sum that indicates by its amount the fact that the tract is confessedly mineral, the Calaveras *Chronicle* suggestively says: "This sale, like that of the Peck Ranch, some two weeks ago, gives the prospectors another gentle reminder that, if they wish to sell a mine, simply locate a ranch, then swear there is no gold on it. Next thing following will be a sale."

FORTY-EIGHT mining companies incorporated in West Kootenay, B. C., since January 1, 1891, with a capitalization of $35,675,000. The largest are the Le Roi and Hall mines, limited, each with a capital of $2,500,000. There are four companies with a capital of $2,000,000 and over, nine of $1,000,000, one of $800,000, one of $600,000, nineteen of $500,000, one of $400,000, four of $250,000, one of $225,000, one of $200,000, six of $100,000, and one of $50,000.

THE London *Times*, the particular and especial organ of British interests, states its standpoint in a nutshell as follows: "It seems impossible to get bimetallists to understand that there is quite a large number of us for whom a general rise of prices has no charms whatever. We like them low, and the lower the better. If they all went down to half their present figures we should rejoice, because we have nothing to sell and a great many things to buy. For those who have things to sell we do not feel any great concern."

AT the Rio Tinto copper mines, in Spain, which is supposed to be the oldest "going" mining location in the world, having been opened about 2,000 B. C., the company is now working 12,000 men and $100,000,000 worth of ore has been blocked out by diamond drills. About $30,000,000 has been taken out in the last seven or eight years. About the old mine, which has seen so many nations come and go and so many dynasties rise and fall, has built up a town of 20,000 people. Though this queer mine is so old, it is even now but 400 feet deep below the surface. It is an immense body of sulphide of iron, yielding 2½ per cent in copper.

HOLDERS of unpatented mining claims should bear in mind that by the 31st of this month they must be able to show $100 worth of work or improvements done on the claim since January 1st, '95; any claim on which such amount has not been done or expended during the year is liable to relocation. It should also be remembered that an affidavit of such work or improvement should be filed with the clerk of the county or the recorder of the mining district before Jan. 1st, '96. While from a final legal standpoint such filing may not be found necessary, yet it is more economical and satisfactory to comply with State as well as federal requirements.

IT is claimed by the *Prospect* that no single mine in Nevada, Sierra or Amador counties ever had a record of yielding as much gold for either a single year or a single month as the Utica mine. The output of the Plymouth Consolidated mine in Amador county of $1,033,548 in 1884 was the greatest product in its history, and the Standard Consolidated mine in Mono county a little over $2,138,000 in 1881. Last May the Utica mine is said to have made a cleanup of something like $900,000, which is considered the largest product in its history: it has already broken the record of the Bodie Consolidated mine, which made the largest cleanup—$600,000 in the single month of July, 1878.

NEW YORK mining men are represented as undecided whether to "start a mining boom" in San Francisco, New York, Cripple Creek or Chicago. One dispatch says committees have been appointed "to look into the matter." The thing is amusing, from a Californian standpoint. If our New York friends want to "start a boom" no one can probably prevent them from trying; but no one here connected with legitimate mining cares a continental for such manœuvering. California gold mines are not listed, as a rule, and there is as much difference between investments in mines here and investments in mining shares as there is between growing wheat and buying futures in that useful breadstuff.

THE mines of Kansas produce 30 per cent of the total zinc output of the United States, and about 2 per cent of the total output of lead. Operations so far are confined almost entirely to the southeastern part of Cherokee county. The veins are not regular, and generally followed up or down, whichever direction they may go. There is very little system used, as the plan of leasing allows each prospector to work the ground in accordance with his own ideas. Companies or individuals lease a number of acres of land, and subdivide the tract into mining lots, 200 feet square, which they sublet to miners, who enter into contracts with the original lessee to mine the ore for a certain per cent, the price to be fixed according to the selling rate of lead in the St. Louis market.

BETWEEN September and the middle of last month the depreciation in South African mining stocks amounted to nearly £78,000,000, or $390,000,000. The drop in shares of the Chartered Company of South Africa was £10,000,000; the De Beers diamond mine showed a decline in the market price from 161¼ to below 130—a shrinkage of £5,500,000. The London *Statist's* Johannesburg correspondent, under date of October 14th, cites an instance where some enterprising promoters in the Rand had appropriated a portion of the title of a respectable mining proposition, and acquired some thirty claims which were on the wrong side of the dip of the gold-bearing strata, which presented no indication whatever of an outcrop of the reefs, and which, when publicly sold at auction not many months before, brought one penny per claim—less than half a crown for the whole lot. These they proposed to float in London at the modest figure of £150,000, or at the rate of £5000 per claim!

THE Elkhorn mine, which has for five years been one of the greatest gold producers in Montana, will be abandoned after next April. Superintendent Molson concludes that the ore bodies which have proved so productive on the upper levels have become too narrow and low grade to permit of their profitable working or to justify further exploration of the mine in depth. He is of the opinion that the reserve ore in sight represents about three or four months' working at the present rate of production, and that after this has been extracted the Elkhorn mine must be considered as exhausted. The company does not intend to go out of the business of mining. It announces that a plan of reorganization will be presented at a meeting of the stockholders at the London office this month. The company proposes to purchase three mines in the East Fryer Hill district at Leadville, Colo., for £86,000, in cash, and to carry on the operations of the company as before. The Elkhorn company has paid to its stockholders the amount of capital stock and 50 per cent additional, which will have been equal to 10 per cent per annum since the beginning.

Notes on Gold Milling in California.

NUMBER IV.

By E. B. PRESTON, M. E., Field Assistant State Mining Bureau.*

The Plate-Block (*Chock-Block*) consists of wooden blocks bolted solidly together, and fitted and keyed to the lower edge of the mortar along the discharge opening, with one part projecting above the other, forming a recess on top to contain the screen frame, and lined with a piece of blanket to make a close joint. The inner side is sloped or rounded off, and fitted with an amalgamated plate. The front and ends are faced with iron plate to protect the wood. Two or more sets of these chock-blocks should be provided, of which one stands 2 inches higher than the other; they are then used alternately, the higher one with new shoes and dies, to be replaced by the lower one when the dies are worn down somewhat, to retain a more even discharge than would otherwise be possible.

The Drop is the height through which the stamp is raised by the cam, and through which it drops when released. Usually it is the same for all the stamps in a battery, although the end and feed stamps sometimes receive a different drop. It is regulated through the raising or lowering of the tappet, and depends mostly on the hardness of the rock. It is one of the factors in determining the speed with which the blows from the stamp shall be repeated. The usual combination of the two in the California mills, is a low drop with rapid motion.

The Discharge is the distance between the top of the die, when in place in the mortar, and the lower edge of the screen through which the pulp discharges. It is one of the most important factors in the duty of the stamps and the gold output from the ore. It should be maintained as nearly as possible at an even height through the entire period of crushing; the height of the chock-block or screen frame being lowered to correspond with the wear of the die. A further means used to retain an even discharge is by placing a two-inch iron plate under the dies, when worn thin. The discharge stands in a certain relationship with the fineness of the screen; low discharge goes with coarser crushing, a high discharge with the opposite. The discharge varies in California from 4 to 10 inches.

Water Supply.—Water pipes of three inches diameter are brought along the front of the mortar near the upper edge, with branch pipes one inch in diameter supplied with faucets leading to the feed side of the mortar, to convey the battery water in at the back, or through the plank covering on the top; this water is under moderate pressure. A second discharge pipe is carried down in front of the lower lip of the mortar, where a movable, perforated branch is turned across the front of the screen, discharging along the entire line on the lip; this second discharge pipe also supplies a hose. The battery water should enter both sides of the mortar in an even quantity, and the total amount must be sufficient to keep a fairly thick pulp that discharges freely through the screen. About 120 cubic feet of water per ton of crushed ore may be considered an average, or 8 to 10 cubic feet per stamp per hour.

Aprons and Apron-Plates.—The apron is a low table placed in front of the mortar, just below and in immediate proximity to the lower lip of the discharge, for the reception of amalgamated copper plates. It is set on a sufficient grade to permit the discharging pulp to flow over it in an even stream, while affording the suspended amalgam an opportunity to reach, and adhere to, the plate surface. The size, shape and slope are at the will of the millman; but usually they are rectangular, with the plates screwed down to the table with copper screws, perfectly level and smooth, the sides being secured with wooden cleats. The grade given varies from ½ to 2½ inches to the foot, and the width of the apron is usually the width of the discharge opening of the mortar. In some mills several of these apron-plates are placed consecutively, discharging from one to the other. They are usually rigid, but in some instances the apron next to the mortar stands on rollers, permitting it to be rolled back, and thus giving freer access to the front of the mortar. They should not be attached to the battery frame.

Sluices and Sluice-Plates.—These vary from 12 to 20 inches in width, and are placed below the aprons; they are usually set to a grade different from that of the apron. The plates can be fastened by cleats, or are laid overlapping at the ends, and, if not wider than 16 inches, do not need to be fastened down with side cleats; this permits of their being picked up and cleaned at any time without stopping the battery. The sluices are rarely over 16 feet long—more frequently in lengths of 8 feet—and should always be placed double. The width and grade, as compared with the apron areas, are mostly faulty in California mills.

Clean-up Barrel.—Large mills are supplied with clean-up barrels, which consist of iron barrels supported by trunnions resting in bearings on short standards. One of the trunnions is extended to carry a loose and a tight pulley, by means of which it is revolved. A manhole, with tight-fitting cover, is provided for charging and discharging, and below it is a sluice with cross-riffles to receive the pulp when discharged from the barrel. The barrel should make from thirty to forty revolutions a minute, requiring 2½ H. P. It is used to treat the battery sands when cleaning up the mill; also, all the scrapings from the mill floors, as well as sand from the drop boxes and amalgam traps, large pieces of quartz or pieces of broken shoes being added with water and quicksilver to assist in the operation.

Clean-up Pan.—This is a small amalgamating pan, 3 to 4 feet in diameter, operating with mullers with wooden shoes, and is run at a speed of thirty revolutions, requiring 1½ H. P. When in use the pan is half filled with water, and the amalgam put in, with an addition of clean quicksilver, and, if required, also some lye. After sufficient grinding, the muddy water is run out through plug-holes, the mullers stopped, and the contents drawn off in buckets. The iron found floating on top of the quicksilver is removed with a magnet; the sand is washed off with a small stream of clear water, and if any dross be found covering the surface it is skimmed off with a sponge or piece of blanket.

Cleaning-up Room.—This is an apartment in close proximity to the batteries and aprons, provided with a tight floor, and with a door under lock and key; the floor is best when laid in cement, to avoid all losses from spilt quicksilver or amalgam. It should be well lighted, and furnished with a sloping table large enough to place a screen frame on; also, with one or two water-tight boxes 4 feet long, 3 feet wide and 3 feet deep, for panning-out purposes; these are supplied with plug-holes near the bottom, to drain off the water, besides water pipes and fittings to fill the boxes when required. One or two wide shelves should be provided to hold the chemicals, quicksilver, and utensils used in cleaning up. The latter consist of pans, wedgewood mortar, brushes, scoops, cups, knives, chisels, rubbers, scrapers, and a supply of closely woven drilling or light canvas; the latter is used to squeeze the superfluous quicksilver from the amalgam. A good pair of balances, with a set of accurate weights, capable of weighing the amalgam and the retorted bullion, should also be provided. The table should be made of a solid plank, or a slab of slate or marble, supplied with a raised edge, and grooved around to drain into a pan placed on a shelf attached below the lower end; some tables are covered with an amalgamated plate. It is sometimes convenient to have a small safe in the clean-up room, but it is always better to have the amalgam delivered to the office.

POWER FOR MILLS.

On account of the favorable position of the majority of California mines as regards their proximity to mountain streams and the large ditch systems, the application of water for the motive power of the mills is rendered easy, and where the distance from these sources is remote, electricity generated in such localities and transmitted to the mill is being successfully applied. Where steam power has to be used, the well-timbered western slopes of the Sierra Nevada permit the cost of fuel to be kept at a comparatively low figure. Where both water and timber are hard to obtain, as in the desert regions of the southern part of the State, gas engines have been applied with most satisfactory results.

In applying water power, where the pressure is sufficient, hurdy-gurdy wheels are chiefly used; these are vertical wheels with narrow breasts, having buckets of various patterns radially attached to the outer circumference, the water being projected through one or more nozzles against the buckets at a low point of the wheel, allowing the water to pass from the buckets as soon as the blow has been delivered. The principal patterns in actual use are the Knight, Pelton and Dodds; the actual effective power developed by the Pelton buckets is given at about 75% to 80%. Where sufficient pressure cannot be obtained, the Leffel turbine and the overshot wheel are in use. As the Pelton wheel seems to find the most frequent application in California, it may be convenient for millmen to have the following rule, applicable to these wheels: When the head of water is known in feet, multiply it by 0.0024147, and the product is the horse power obtainable from one miner's inch of water.

The power necessary for different mill parts is:

For each 850-lb. stamp, dropping 6 inches 95 times per minute	1.33 H. P.
For each 750-lb. stamp, dropping 6 inches 95 times per minute	1.18 H. P.
For each 650-lb. stamp, dropping 6 inches 95 times per minute	1.00 H. P.
For an 8x10-inch Blake pattern rock breaker	9.00 H. P.
For a Frue or Triumph vanner, with 220 revolutions per minute	0.50 H. P.
For a 4-foot clean-up pan, making 30 revolutions	1.50 H. P.
For an amalgamating barrel, making 30 revolutions	2.50 H. P.
For a mechanical batea, making 30 revolutions	1.00 H. P.

(*To be Continued.*)

FOR supplying 580,700 pounds of powder for use in siege and coast guns, bids have been received at the War Department, as follows: Dupont Powder Company of Delaware, 25 cents for black moulded and 33 cents for brown; Bernard Peyton of California, 35 cents for brown.

The Corral Hollow Coal Mines.

The following is furnished by a representative of this paper, who recently made a thorough examination of the coal deposits at Corral Hollow:

Prospect work on the Corral Hollow coal mines is practically finished, the owners having satisfied themselves that they have in them a valuable property, and the work of putting them in shape to place their product on the market at an early date is now under way.

The existence of a deposit of coal in Corral Hollow has been known for the past thirty years, and some work has been done on the mines. The beds, however, were owned by a number of companies and individuals whose means were limited, and the work done was confined to surface workings. The coal here was of poor quality, and very little headway was made either in working the mines or introducing their product to the public.

Six years ago John Treadwell, of Alaska fame, secured the different holdings and started a systematic course of prospect work, which he has continued ever since. Few people knew the work that was being done, as Mr. Treadwell desired no publicity until he had assured himself that the mines were worthy of it.

In the course of his labors, prospect tunnels have been run on every section line for a distance of six and one-half miles along the course of the coal beds, in order to determine their direction and permanency, and no variation has been found in the coal formation in the whole distance. Some twelve separate veins of coal have been cut through, varying in width from six inches to twelve feet. The largest seam runs from ten to twelve feet in thickness its entire length, so far as uncovered, and through it run three thin seams of slate; the next largest seam is seven feet and is solid coal. At the point where the principal work has been done a tunnel has been run over 3000 feet along the coal seam, and a shaft sunk on it for a depth of 1200 feet from the surface, and over 400 feet from the level of the tunnel, has been run. At each 200-foot level a long tunnel has been run in this shaft, and through the entire workings the coal beds remain uniform in size, while the coal improves very much in quality as depth is attained. It has been thoroughly tested for steam purposes both by the Risdon Iron Works of San Francisco and the Southern Pacific Railroad and pronounced of first-class quality. There is now prospected a body of coal, including the ten principal veins, 17 feet in thickness, 1200 feet deep and 6½ miles long, containing about 20,000,000 tons. There is, of course, a much larger body than this—how large, it is impossible to say; but this amount has been uncovered and is a certainty.

Having assured themselves of the existence of a practically limitless body of good coal, the owners are now preparing to place it upon the market at the lowest possible cost. A working shaft 22x11, divided into three compartments with a frame of 12x14 pine timbers at every five feet, is being put down at the rate of a bent a day. This is now down nearly 300 feet and follows the dip of the coal body about 56°. A large hoisting works will be erected here, from which a gravity railroad will take the coal to the bunkers at the foot of the hill.

In order to profitably market the product of these mines, the owners are now constructing the Corral Hollow railroad, which is already graded a large part of the way, and will be in operation by the 1st of March. Though these coal mines are located chiefly in Alameda county, running into San Joaquin county, they will be tributary to Stocktou, to which point the greater part of the output will be shipped direct and delivered at from $3 to $4 per ton. Over $800,000 have so far been spent in the purchase of property and preliminary work on the mine, and as much more will be expended on the road.

There is here, without question, a very large body of good coal, and it is in the hands of men who have capital and the practical knowledge to work it with profit to themselves and to the benefit of the public.

WHAT is said to be the biggest single piece of machinery ever shipped across the Alleghanies is now on the way from Philadelphia to Joliet, Ill. It is a fly wheel, weighing 180,000 pounds, made by the Southwark Foundry & Machine Company of Philadelphia for the Joliet Steel Company; it is twenty-eight feet in diameter, and the face is four feet broad. It will require a shaft thirty inches in diameter to operate it. Owing to the weight it was found necessary to make use of two especially constructed cars. The wheel was in halves, a half to a car, as it could not be transported as a whole.

AS A ship passes through the air, says Maxim, the air is divided exactly in the same manner as water would be, and as it comes together again at the stern of the ship it produces an upward current, and it is on this ascending column of air that the albatross and seagull find a resting place and follow the ship for days at a time without any apparent exertion; but whenever they find themselves in front of the ship or at one side, where there is no ascending column of air, they have often to work their passage very much as other birds do.

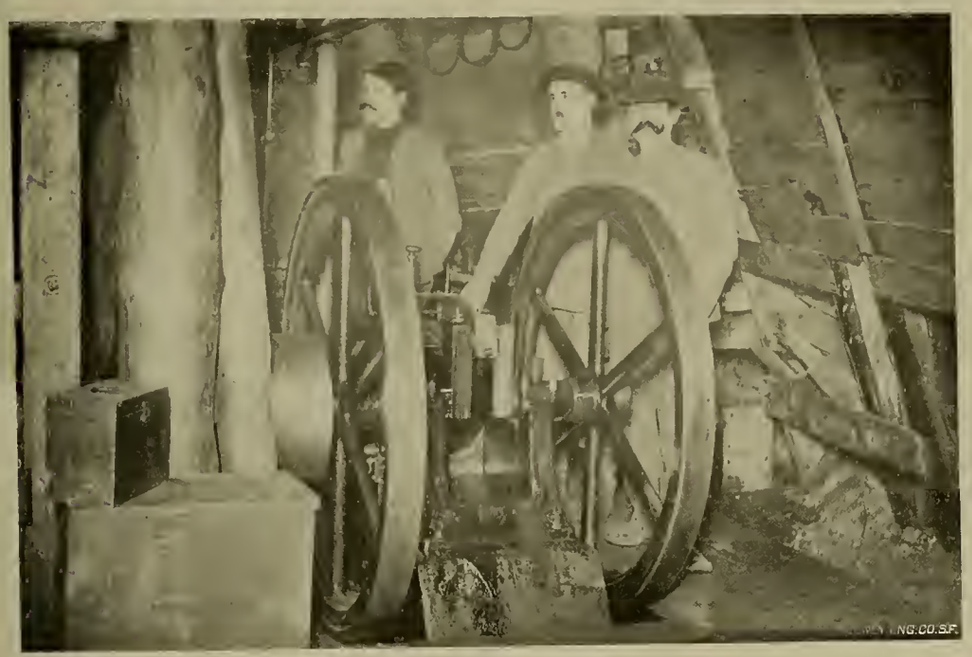
* Bulletin No. 6, California State Mining Bureau.

Meaning of Some Technical Terms.

Electricity is an agent of such widespread and increasing use that the newspapers are continually referring to it in one way or another, and employing technical terms that are not as fully understood by the average reader as by the professional electrician. Repeated explanation of some of these expressions, therefore, is excusable, if not actually desirable.

The best authorities in this department of science admit they do not know exactly what electricity is, although they can tell us a good deal about its behavior. In doing so they find it convenient to compare this particular form of force to a fluid, but caution us to accept figuratively and not literally the phraseology employed in doing so. The word "current," for instance, must not be construed as meaning that any matter of substance moves through the "conductor," but merely that the mysterious energy in question propagates itself along a given route in a manner resembling the flow of a fluid.

There are two forms of current, the "direct" and the "alternating." The one would be correctly illustrated by a steady stream of water issuing from an open faucet; the other, by the movement which a fluid in a pipe would have if a pump attached thereto should alternately push and suck, thus



EIGHT HORSE POWER PUMPING ENGINE IN THE PIONEER MINE.—*See page 369.*

changing the direction of the flow regularly and at very short intervals. The dynamos which generate these two kinds of current bear a close general resemblance to each other. Each has a revolving central portion, called an armature, made up partly of coils of wire, in which momentary electric impulses are excited by passing in front of fixed magnets. But the connections of the wires are such that in one case two successive impulses are merged into one continuous stream, and in the other are not only kept apart, but steered in opposite directions, when issuing from the machine.

The current is led out from a dynamo by means of two carbon bars, called "brushes," resting on the shaft of the armature, and connecting with wires that conduct the electricity to and from the place of consumption. In a direct current machine the brushes press against "the commutator," a split tube, each of whose numerous sections is the outlet for an armature coil. In an alternating generator, the brushes are in contact with a pair of continuous bands, similarly situated and called "collecting rings."

"Sparking" is the development of electric sparks through imperfect contact of brushes and commutator. The phenomenon is not observable in alternating current machines. In many modern dynamos the armature is composed of a number of thin circular iron plates, riveted together in the form of a drum, and having slots across the periphery, in which are inserted copper bars. The electricity is generated in these bars, just as in the coils of the old-style armature, and conducted down to the collecting ring, or the commutator, by means of wires which together present a pretty spiral on the side of the drum. The only true coils seen in such a dynamo are those encircling the "field" magnets fixed in the stationary outer frame.

Electricians find it necessary in generating, conveying and applying a current to treat it as if it had both volume and pressure, like water in motion. A visible fluid, for instance, may pour from a pipe in a large or a small stream, according to the quantity transmitted; and it may come out either languidly or in a jet so swift and hard as to run a mill-wheel. Volume is computed in "amperes," and pressure in "volts." The total amount of energy possessed by a current is ascertained by multiplying the number of amperes by the number of volts. The product is in "watts," and 746 watts are equivalent to one-horse power. A thousand watts, or a "kilowatt," is equal to one and a third-horse power.

For some purposes it is desirable to have a large amperage and a low voltage, and for others a low amperage and a high voltage. But a current is not always generated in just the quantity or at just the pressure required. This is particularly true where one large plant supplies electricity to several consumers, one using it for lighting, another for heating, another for welding and another for power. Hence apparatus has been devised which will change voltage. It is called a "transformer." Of course, when it raises the voltage of a current it reduces the amperage, and vice versa. The total amount of energy is not altered, except that in the process of transformation there is always a certain small loss. The instrument to which the name "transformer" or "static transformer" is now exclusively applied is capable of altering the voltage of alternating currents only. In principle this device is like two coils of wire, carefully insulated from each other, but placed together so that a current flowing in one, the "primary," excites a current in the other, the "secondary." If the secondary has ten times as many turns of wire as the primary, the voltage of the induced current will be ten times that of the original current. A well-made static transformer delivers to the secondary circuit about 96 or 97 per cent of the total energy put into the primary.

Inasmuch as the means just described are not available for altering the voltage of a direct current, one must either use the latter form of current just as it comes from the generator, or else employ a more wasteful method of conversion. If an electric motor and a dynamo were arranged so that the armatures of the two were mounted on the same shaft, and if the armature coils of the motor were wound for a different voltage than were those of the dynamo, we could lead our current into the one machine, and, by thus driving the other, could generate a second current at a higher or lower voltage than that of the first. Instead of having two entirely distinct machines, however, we could put two sets of coils on a single armature, using one set as motor coils and the other as generator coils. A machine of this sort, called a "motor-dynamo" or a "dynamotor," would change our voltage for us, but at an expenditure of about 18 per cent of our total energy.

Still another sort of change, from an alternating into a direct current, or from direct to alternating, is needed sometimes. For such service a machine very much like the one last described is employed. In a motor-dynamo, though, the leading-in and leading-out mechanism are both commutators, while in the "rotary converter" there is on one side of the armature, properly connected with one set of armature coils, a commutator, and on the other side, connected with the second set of armature coils, a pair of collecting rings. Whichever side is used, then, by the driving current, the other side will give out its own peculiar type of current.

Even the best conductors of electricity, such as copper, offer some resistance to its passage. The larger the wire, the more easily the current will flow, and the less will be the loss of energy from this source. But if the line be a long one, the cost of the copper may be too great. Fortunately, though, a current can be sent over a smaller wire at a high voltage than at a low one. Hence, for long distance transmission, it is customary to use a "step-up" transformer at the generator end of the line, and a "step-down" transformer where the current is to be applied. The great Niagara dynamos generate alternating currents, and do so at a voltage of 2000. To supply a consumer engaged in making aluminum with a "low tension" direct current a static transformer is used to get the voltage down to 115, and then a "rotary converter" completes the alteration. But for transmission to distributing centers in Buffalo, Rochester, Pittsburg, Syracuse and more distant points, the current will no doubt be transformed up to at least 10,000 or 20,000 volts, and possibly 50,000 or 60,000. Lord Kelvin once suggested the possibility that electricity might be sent from Niagara to New York City at 80,000 volts. At present 14,000 is the highest actually in use anywhere, although 20,000 was employed on the famous Lauffen-Frankfort line in Germany, 110 miles long, operated for a few months in 1889. During part of that time a pressure of nearly 30,000 volts was employed.

Asphalt in America.

The following has been condensed from advance sheets of the annual report on mineral resources by the United States geological survey.

The amount of asphaltum and bituminous rock produced in the United States in 1894 was 60,570 short tons, valued at $353,404. Compared with 1893, this shows an increase in product of 12,791 short tons, but a decrease in value of $18,832. The increased production was due to greater activity at the bituminous sandstone mines, both in California and Kentucky, while a decrease in the production of the purer forms of asphaltum in California and Utah is accountable for the comparative falling off in value. There was no bituminous limestone mined in Utah during 1894. The product, therefore, was limited to bituminous sandstone and hard, or gum, and liquid asphaltum. The production of these materials in 1894 is shown in the following table:

	Short Tons.	*Value.*
Asphaltum	9,700	$195,800
Bituminous rock	50,870	157,600
Total	60,570	$353,400

Divided by States, the product was as follows:

States.	*Short Tons.*	*Value.*
California	51,187	$251,991
Kentucky	5,383	21,400
Utah	1,000	35,000
Texas	3,000	45,000
Total	60,570	$353,400

The following table shows the annual production of asphaltum and bituminous rock in the United States since 1882:

Years.	*Short Tons.*	*Value.*
1882	3,000	$10,500
1883	3,000	10,500
1884	3,000	10,500
1885	3,000	10,500
1886	3,500	14,000
1887	4,000	16,000
1888	50,460	187,500
1889	51,735	171,537
1890	40,841	190,416
1891	45,054	242,264
1892	87,680	445,375
1893	47,779	372,232
1894	60,570	353,400

The total amount of hard and liquid asphaltum produced in California during 1894 was 5790 short tons, and of bituminous rock 45,397 short tons, the aggregate value of which was $251,991.

The entire product of Kentucky is bituminous sandstone, all of which is used for street paving in the interior cities. The product in 1894 was 5383 short tons, valued at $21,409, against 1129 short tons, valued at $6570, in 1893.

A considerable deposit of asphalt has been noticed in Park county, Mont. The material is unusually pure.

The imports of asphaltum into the United States include hard asphaltum from Cuba, Trinidad asphaltum from the island of Trinidad, off the coast of Venezuela, South American, and bituminous limestone from Neufchatel and Val de Travers, in Switzerland, and Seyssel, in France.

The following table shows the imports of crude asphaltum since 1880:

Year.	*Long Tons.*	*Value.*
1880	11,830	$87,889
1890	73,861	223,368
1891	102,433	299,350
1892	130,255	336,868
1893	74,774	196,314
1894	102,505	313,680

Mining Summary.

CALIFORNIA.

Amador.

THE BELLWETHER.—The purchase price of the Bellwether is stated to he $110,000: the new proprietors hegin operations Jan 2, '96.

BAY STATE.—Supt. Jones of the Bay State, opened up a tunnel from the west side of the mine above the hoisting plant recently and milled some rock from a ledge which crops out in the hillside above their works. The returns were $6 per ton in free gold. He has five stamps at work on ore from this tunnel, while the other five are at work on ore from the mine. He is running a crosscut from the shaft at the 100 level to the new ledge.

AROUND DRYTOWN.—A "revival" is reported from the old mining district of Drytown. Negotiations are in progress for the sale of of the Loyal or Black Hills claim for $40,000. The property is bonded for that amount to L. H. Newton of San Francisco and Mr. Gray of Oakland.

The Gover mill and mine will soon be in operation again.

LACKS AUTHENTICITY.—According to local reports, the Cramp brothers, ship builders, are interested in the Philadelphia reduction works and claim to hold patents on appliances, by the use of which they can work sulphurets at a cost of $3 per ton. Some months ago they thought they had arrangements made to construct a plant to use their process at Angels, to handle the products of the Utica company, but at the last moment, and after they had shipped six carloads of material to the State, some hitch in the arrangements developed which caused them to decide not to erect a plant at Angels, and their agents commenced to cast about for another place to locate. An Amador paper says tbe Cramp's representatives are now engaged in making tests and chemical analysis of the ledge matter for several miles, on either side of the Cosumnes river, and have under consideration the consolidation of a large number of claims at that point, the erection of a large number of batteries, probably 100 stamps to begin with, and the erection and installation of reduction works of sufficient capacity to handle the product of their mills.

Calaveras.

THE TULLOCH MINE.—At tbe Tulloch mine, the mill is now ready to crush the 700 tons of ore now on the dump.

TO ERECT WORKS.—*Prospect:* Mr. Sceiffert says that the company who have his mine under bond have authorized their agent, Mr. Deidesheimer, to at once erect all necessary machinery for working the Sceiffert mine, and to sink as soon as possible. Mr. Sceiffert will receive a good portion of the purchase money Monday. From all appearances the company is in earnest about this property and in a few months will no doubt have it well under way of development.

THE GWIN MINE.—The shaft of the Gwin mine is down 1050 feet.

El Dorado.

PLACERVILLE, Dec. 4.—(Special Correspondence)—J. Bryant & Son are constructing a 10-stamp mill on their property, four miles southeast of here. They are crosscutting on the 60-foot level. They have 100 tons of ore ready to be milled.

The Lady Emma, six miles northwest of this place, has a 2-stamp mill in operation for prospecting purposes. The results thus far warrant the erection of additional stamps in the spring. The property is owned by F. W. Beardslee.

Rainy & Smith are building a 10-stamp mill on their quartz mine, four miles northwest of Placerville.

Development work on the Wykel mine, five miles southeast of here, is progressing rapidly. Mill tests of ore yielded $8 per ton. This is owned by Shaub, Sturtevant, Cade and Taylor of Oakland.

J. E. Spencer is erecting pump and engine on the old Hagar mine, nine miles south of town, with a view to sinking deeper in the old shaft and doing development work on this one-time productive plant.

The Linden gravel mine, two miles east of here, owned by A. Sinclair of Boston, has in operation a 10-stamp mill that crushes 75 carloads of 1800 pounds each per day. The gravel is carried through a bedrock tunnel 4000 feet long. The plant comprises 300 acres.

The old Havilah mine was reopened within the present year and is running 20 stamps on high grade ore. This is situated twelve miles below Placerville and is the property of A. Harpending.

Development work recently begun on the Larkin mine, three miles from here, is progressing favorably. This property is squarely on the mother lode. D. H. Jackson is working it under a bond.

San Franciscans bave bought the old Mt. Pleasant, near Grizzly Flat, and are reopening the old works with vigor. This was a famous gold producer in its day. Rock recently found is high grade.

R. M. Mooer has bonded the old Boh Red properties and is pushing tunnel and shaft ahead rapidly. Selected ore from the tunnel assays very high.

The old Pocahontas, celebrated in its day as a gold producer, is being rehabilitated by English capital. The work that is being done is of a substantial character, with a view to enabling its present owners to work the property with system and for many years to come. It is situated seven miles south, in Old Logtown, one of the richest camps at one time in El Dorado county.

This county has plenty of good properties awaiting the capitalist's attention. The old abandoned mines that are being worked to greater depth are rapidly proving a good investment. Favorable terms can generally be made, either for a bond or outright purchase.

A PREDICTION.—*Gazette*: A table of gold production by counties, published in the MINING AND SCIENTIFIC PRESS, gives El Dorado for 1892, $198,321; for 1893, $295,830; for 1894, $367,063. Reckoning from the scores of busy stamps, the hydraulic mines started up, and increased mine development which started within the past year the gold product for 1895 cannot fall short of $600,000 and will prohably reach the million mark by the close of the coming year.

THE OLD JONAS BITTERS CLAIM.—*Gazette:* The Two Channel Mining Company, with H. E. Picket as manager and W. C. Green supt., has taken hold of the Shoofly, (hetter known as the Kenna mine) Wilton, Tiedeman, South Otter and Yellow Jacket, hesides several new locations, and altogether have now thirty men at work. The property extends from Missouri canyon on the north to a half mile south of the Eight Mile House adjoining the Lake Tahoe road, a distance of more than four miles.

Humboldt.

A Eureka dispatch says a week ago a dozen Japanese contract laborers went to Gold Bluff, in the northern part of Humboldt county, to take the place of the white men working in the mines there. The Americans had been told that the Japs were to arrive, so they organized, and when the Japs put in an appearance tbe spokesman told the coolies they could stay over night, but that in tbe morning they must go back to where they came from or there would be trouble. This was sufficient. The Japs beat a basty retreat, the Americans warning them not to return. The owners of the mines have thrown the white men out of employment and trouble is feared before a settlement is reacbed. It is reported on good authority that the Japanese had come up to labor for $5 per month and board.

Kern.

RANDSBOROUGH.—Fifty miles N. E. of Mojave, ten miles east of the Goler district is Randsborough mining district in the desert, 5000 feet above sea level, where 100 men have about twenty-five locations tbat show free gold. Dry washers are mostly in use. Wood and water are the great wants and until the latter is found in sufficient quantity and transportation facilities are better the camp cannot attain the heigbt of its fortunes.

THE CONFIDENCE MINE.—George Montgomery will haul freight from Daggett to the Confidence mine, in Death Valley, over a hundred miles distant. It is eight miles northwest of the Ibex mine, and has a ledge 50 feet wide, of fine milling ore. Fifteen feet of this mills $40 to $75 to the ton, while tbe remainder runs $15 to the ton. He is putting in a 30-ton Bryant mill, and is seven miles from the mine. Gasoline is used to run the engine, that being the cheapest fuel obtainable.

Mono.

THE GREEN CREEK DAM.—The Standard Con. Mining Co's. dam at Green creek is finished. It is twenty miles from Bodie and spans Green creek canon 4,000 feet above the power house. It was planned by Andrew Smith of Bodie and constructed under bis supervision. R. G. Brown, Supt. of the company, had 85 men at work on it this past summer.

The foundation is of pine logs three feet in diameter, and is 57½ feet wide and 80 feet long. The depth of the toe-piling below the foundation varies from 15 feet in the center to 9 feet at the sides. The toe-piling runs into blue cement and bed-rock, and is made of hewn pine logs pointed up with cement. The dam is 42 feet bigh and varies in length across canyon from 80 feet at bottom to 235 feet at top. Its width varies from 57½ feet at bottom to 15 feet at top. The front has a batter of 45 degrees: the back has a batter of 1 foot in 4. The dam proper required 1000 tamarack logs with an average diameter of 16 inches and an average length of 32 feet. These were built up in crib-work of 10-foot squares filled with stone and gravel.

The timber in the lower half of dam is pinned together with iron pins 22 inches long hy 1 inch in diameter; the upper half is treenailed with 2-incb pins 2 feet long made of butt cuts of tamarack timber. The back of dam is covered with 3-inch planking corked with cedar bark, on hearings 3 feet from center to center at bottom and 3 feet 9 inches at top. The spillway proper is 37 feet high: its slope varies from 18 feet at bottom to 35 feet at top. The apron of the spillway is 30 feet long, 18 feet wide, 5 feet high, and required 72 hewn logs each 36 feet long in its construction. The spillway is braced to the dam secure against snow. The opening for this on top of dam is 35 feet long and 20 feet wide, divided into six equal spaces containing regulation gates to control the overflow.

The storage reservoir has an average length of 1000 feet; 250 feet in width, depth varying from 10 feet to 32 feet, giving it a capacity of about 24,000,000 gallons.

On the west side of the dam is the fishway 300 feet long inside measurement, 3 feet in widtb by 2 feet in depth. It contains 118 buckets or fish-rests, and required over 11,000 feet of lumber in its construction. It has a fall of 1 foot in 7 feet, and at the upper end is connected with the reservoir by a suitable bulkhead made of 4x6 timbers arranged as gates to control the flow of water through it.

Under the spillway and extending into the dam are two tunnels, each 14 feet long, 6 feet wide and 10 feet high. These tunnels are frost-proof and each contains a 24-inch valve weighing 1500 pounds, which are secured to the pipes hy lead joints, one heing for the purpose of emptying the dam when necessary, the other feeding the 4,000-foot pipe line which leads to the power house. The line is divided into four sections with pipe varying from 24 inches in diameter at dam at 18 inches at power house, middle sections being laid with 20 and 22-inch pipe. The 18-inch is all lead-jointed while that of the other sections is slip-jointed.

The reservoir is fed by springs, melting snow and several small lakes in tbe vicinity of Castle Peak.

Nevada.

GOT THE WATER OUT.—*Transcript:* All the water is pumped out of the Yellow Diamond mine and Supt. Jacobs will now continue the development of the property on a larger scale. They are now at the point where exceedingly rich gravel was encountered just before they were forced to suspend operations.

PITTSBURG MINE SOLD. — The Pittsburg mine, situated near the Town Talk, was sold last week to S. Granger for $3,300. He had to satisfy judgement on foreclosure of mortgage.

THE LINDSEY BONDED.—*Union:* The Lindsey mine, Washington mining district, bas been bonded to J. B. Tully of Grass Valley.

WILL RUN A TUNNEL.—The lessees of the Enterprise mine, formerly the Gold Tunnel, who have heen doing development work on Lost Hill for some months past, have moved all the machinery and materials near to a point on Deer creek, where they intend to commence a tunnel.

THE KENTUCK MINE.—S. Blight has begun work on the Kentuck mine, opposite tbe Maryland. The shaft is down 250 feet.

AROUND WASHINGTON. — The California mine employs twenty men. D. Harmon is superintendent; W. Williamson, foreman.

About the same number are at work at the German.

At the Spanish mine about 130 tons are daily crushed. Superintendent, D. Johnson.

At the Oak Tree mine the twenty stamps are at work.

A contract will be let at the Washington mine for sinking 200 feet from the 400 level.

THE BULLION MINE.—G. Mainhart tells the *Tidings* that as soon as tbe electric power furnished by the Nevada County Electric Power Co. is available the Bullion mine will put in dynamos and the machinery will be run by electricity. The plant will be an extensive one and will he the first mine in the district run by electric power.

Placer.

BLACK HAWK BONDED.—The Black Hawk gravel mine, north of the Mayflower, has been bonded to Dr. Brewer, of this city, for eighteen months, with privilege of purcbase for $40,000: $6,000 has been put up for development.

EVENING STAR MINE.—*Sentinel:* Sacramento capitalists have located a river claim near Colfax which tbey have named the Evening Star mine. They have located a portion of the American river from a short distance ahove Shirt Tail canyon to a point above Indian canyon.

A numher of gravel banks will be worked during the winter. Next summer it is the intention of the company to turn the river for a long distance and clean up the hedrock.

Plumas.

THE SHENANDOAH.—Supt. King, of the Shenandoah has run twenty-two tons of roasted ore through the mill, but the gold would not amalgamate. From the run, however, 3300 lbs. of clean, dry sulphurets were saved and shipped here.

THE PLUMAS IMPERIAL.—*National-Bulletin:* The work of fitting up the Plumas Imperial mine has been concluded, the force of men employed coming down to Quincy Wednesday. The property is now ready for active working next spring.

Riverside.

THE GOLDEN CHARIOT.—A ledge of ore has been uncovered in the Golden Chariot mine in a drift driven twenty-five feet from the hottom of the 300-foot shaft. The Golden Chariot is an extension of the Santa Rosa.

Sierra.

GOLD VALLEY.—At the Gold Valley mine fifty-six men are now engaged in development work; ore enough is taken out to keep a small mill at work. After the mine is opened to a depth of 300 or 400 feet, more extensive machinery will probably be put on. The mine is about twelve miles above Downieville.

BOUGHT BY SCOTCHMEN.—A Glasgow syndicate has bought the Alaska and Grizzly near Pike City. The company has a capital stock of $225,000, of which $100,000 is to be devoted to putting the Alaska in better shape, developing the Grizzly and putting in additional machinery. The present idea is to sink a new shaft outside the ledge or drain the present workings by a tunnel. It is helieved that 20 additional stamps will be put in next spring.

Siskiyou.

GENERAL MINING NOTES. — *Union:* The Commodore mine, on Barkhouse creek, back of Walker P. O., Klamath river, was discovered by R. E. Billups last July, and is owned and operated by Billups & Humphreys of Yreka. They have run a tunnel 100 feet and tapped the ledge at a deptb of 140 feet, and then ran a crosscut tunnel 150 feet. They have also a raise of 75 feet. The ledge runs from 18 to 36 inches in width, as shown by a winze sunk; rock averages $30 to the ton. They have a twin arrastra capable of crushing four tons a day.

The Bunker Hill mine, 18 miles below Happy Camp, owned by G. B. Temple, is sold to Hughes & Hilbert for $10,000.

The Thomas mine, near Cottage Grove, is in operation at present, and is paying from $60 to $80 a day, averaging about seven dollars a hand.

The Gold Ball Mining Co. has leased to the American Mines Association of Montana, four claims in Liberty mining district, and agrees to furnish $5,000 in cash for the purpose of erecting an 850 lb. twenty-stamp mill and all necessary machinery to make a complete mill. The life of the lease is twenty-seven months.

Lamb's mill at Yreka creek, is busy crushing ore taken from the Wademan mine on Green horn.

Trinity.

CLOSED DOWN.—The Strode Bros'. mill and mine near Trinity Center closed down on the 12th ult.

AROUND TRINITY CENTER.—*Journal:* At the Altoona mine, John Stridger, supt., ninety-five men are at work; the mine will run steadily through tbe winter. Enlarged machinery for pumping and boisting has heen put in and preparations are being made to sink for two new levels.

At the Integral mines the force has been increased to sixteen men, who will develop the property this winter.

At the Nash Deep Gravel mine on Coffee creek, the Trinity Gold Placer Mining Syndicate, W. Maitland, supt., have twenty-two men sinking in the deep channel to reach hedrock to drift and running a 600-foot tunnel through a rocky point to obtain grade and dump for bydraulic mining.

The Rainhow company on Coffee creek have been sinking to open a drift claim on the creek, and have struck good pay a short distance from the bed-rock. They are also developing a quartz prospect two miles from their drift claim.

The Bonanza King owned by Vellmers, Ellery, Doty and Fillman have closed the mill for the season. Men will be kept at work on the mine through the winter running tunnels, developing and caring for the property. Since Aug. 4th of this year six miles of road and one and one-half miles of trail have been dug and graded; a five-stamp mill aud engine has been hauled in, set up and put in running order, 150 tons of rock have been packet on mules from the mine to the mill and crushed. The results of the crushing were entirely satisfactory to the owners.

Tuolumne.

THE STARR MINE.—A ten-stamp mill is heing completed at the Starr mine. A strike has been made recently. They have drifted on the ledge 100 feet, the ore still showing well in the face.

Yuba.

SMARTSVILLE MINES.—The Smartsville correspondent of the Marysville *Appeal* says the Excelsior Water and Mining Company will shortly resume operations there.

NEVADA.

ESMERALDA COUNTY.

THE GERTIE ORE.—Thirty tons of ore from the recent strike in the Gertie mine near Coryville, worked in the mill last week produced a gold bar worth $2,000. This ore was taken out by four men in a month.

SILVER PEAK.—The cyanide has arrived and the leaching is going on. There has heen considerable ore taken out recently that will mill $30 per ton. The tunnel, which is heing run to open the ledge and to tap the mine generally is more that half completed, and it is expected that two months more will finish it.

RETURNED $2,000.—The lessees of the Big Indian, or the Gertie mine, milled 30 tons of ore that returned them about $2000.

Owens' Bros. have taken out 300 tons of $80 ore from the New Party mine in Silver Star.

OREGON.

A CONTENTED MAN.—W. H. Miller has a ledge on Soldier creek near the Illinois river, wbere he mortars $10 to $12 a day. He has no disposition to bond, sell, form a stock company or put on a big force of men, but quietly pounds out the gold dust from day to day, lives all alone, and is rich and content. The ledge is there; he owns it; his wants are few, and he is as "independent as a hog on ice." This dream of wealth and content is realized twenty miles west of Kirby.

AT GOLD BASIN.—About eighty men are at work at Gold Basin getting ready to turn water. Several hundred acres are believed to average thirty cents to the cubic yard. The gold fields are not in a basin, as the name implies, but on the side of a high ridge where water has to be hoisted to a height of 2500 feet. This hoisting process is where the difficulty and expense come in, and a series of powerful pumps will be put in operation. The mines are not far from the Josephine and Coos county line.

SOLD CHEAP.—The property of the Oregon Gold Mining Co., located at Cornucopia in Union county, was sold by the sheriff under execution last Tuesday. This property had heen valued as high as $500,000 and was sold several months ago under execution for $9000, which amount appeared so inadequate that a resale was ordered; hut it was bid in the second time by the same parties and at the same figures as formerly.

WASHINGTON.

METHOW DISTRICT.—The Ben Lummon Gold Mining Company has incorporated; capital stock $2,500,000; to operate the Ben Lummon group of mines, including the Little Giant, Ben Lummon, Exchange, Florence, Grace, Columbia and North Star, on the Twisp river, Methow district. Incorporators: L. M. Boardman, J. S. Parker, W. R. Marvin, D. B. Fotheringham, W. S. Dawson, W. France and W. Lockhart.

BRITISH COLUMBIA.

SOLD HIS INTEREST.—Rossland *Miner:* James Breen has sold his interest in the Trail smelter to W. A. Clarke, of Montana, for $20,000 cash. He remarked when he showed the draft for that amount. "This is pretty good for a summer's work" It is to be inferred from this that Mr. Breen acquired his interest by his expert services, part of which consisted in making a contract with the Le Roi Mining Company for 75,000 tons of ore at $11 per ton. It is understood he will remain in charge of the smelter for one year at a salary.

GENERAL NOTES.—The jumping of the Homestake mine at Trail Creek did not interfere with the work. The new syndicate is going ahead with development under the direction of J. M. Burke.

The Pend d'Oreille Hydraulic Mining Co., operating near Waneta, will put in a pump with great capacity.

Ore has recently been uncovered in the

North Star mine, in the East Kootenai, which is said to run 205 ounces in silver and 40 per cent lead.

A mining association has been organized at Fort Steele.

There were 140 mining locations recorded in the Fort Steele district this year.

It is claimed that there is "auriferous gravel enough in Cariboo, B. C., to keep miners busy for 600 years."

UTAH.

BIG REDUCTION PLANT.—Capt. De Lamar will in the spring erect a mammoth reduction plant for his Golden Gate group. He will also erect an expensive hoisting plant and is getting the property in shape for production.

AT BLAKE.—At Blake, eastern Utah, the Bennett Amalgamator Manufacturing Company are putting up a $60,000 mill to work the mines on a large scale. It is claimed for Mr. Bennett's machine that it will save particles of gold ore almost invisible.

CAMP FLOYD DISTRICT.—The Old Fred Gold Mining and Milling Company has incorporated; capital stock, $2,500,000. Incorporators—C. Burkhalter, Wymore, Neb.; J. L. Atkinson, Evanston, Wyo.; H. F. Menough, G. H. Leighton, A. B. Gibson, E. McCarrick, Salt Lake City. The company will buy and operate the Old Fred, Old Fred No. 2, Ouida, Homestake, Apex, Nugget, Defense, Pluto, all located at Sunshine, Camp Floyd district.

IDAHO.

THE COEUR D'ALENES.—The Bunker Hill and Sullivan mine employs 400 men. The tramway daily conveys 500 tons of ore from the mine to the concentrator.

Thirteen thousand dollars was disbursed to the workmen at the Last Chance mine last pay day.

Both the Chest mills are running on a slightly better quality of ore.

Another five-stamp mill will be located three-quarters of a mile from Murray.

The Standard mine and mill has closed down owing to the scarcity of water.

The gravity tramway from the You Like mine is nearly completed. Mining men are complaining about the unusually low water in that section. The recent cold snap has diminished the flow, and many of the mines and mills have been compelled to shut down for lack of power. On Canyon creek only two mills are running—the Tiger and the Frisco. The Tiger is using steam power. The Poorman, the Standard and the Granite are all closed down. At Mullan the Morning is also closed down by the same deficiency.

ANOTHER ACCIDENT AVERTED.—*Avalanche:* At the time of the fatal accident to Foreman Schott at the Poorman, all work in the face of the adit tunnel and the upraise was discontinued, pending its inspection by the State Mine Inspector. Luckily this action was taken, for shortly after the miners were withdrawn the water broke through the face of the tunnel, demonstrating that old workings are in close proximity. The precaution of General Manager Grothe in ordering a six-foot hole drilled ahead at the breast has probably saved many lives, as it was from this "feeler" that the break occurred, although some time subsequent to its being drilled. These recent developments at the Poorman are very discouraging to the management. They had every reason to believe that they had two hundred feet of "backs" at that point, and find that instead they are in a nest of deserted and decayed workings, not only lacking in ore, but dangerous in the extreme to investigate. There should be a law compelling mining companies to keep maps and records of their underground works, so that the disappointments and accidents experienced by this company could be avoided in the future. The mill at this property is running steadily from ore extracted in other portions of the mine.

LARGE PLACER OPERATIONS.—A crew of men are working on the placer claims on Salmon river, at the mouth of John Day, preparing for extensive work next spring. These claims were purchased from George Alkire by a syndicate of Spokane Republican politicians, consisting of U. S. Senator Wilson, State Senator Ide, ex-Register Strong and others. They have been operating the ground all summer and report good results. They are now constructing 7,000 feet of new ditch and flume which will give a fall of 340 feet to the boxes. It is being built along a dangerous shale bluff. The flume is two feet deep and three feet wide and will carry about twenty cubic feet of water per second, or from 800 to 900 inches. A No. 2 giant, with 14-inch nozzle, will be used. The boxes are thirty inches wide and set on a nine-inch grade.

MONTANA.

A POLE TRAMWAY.—The Chicago and Montana Mining Company contemplate putting in a pole tramway from the Snowshoe mine to the Great Northern station at Libby. Such a tramway can be cheaply built and is very effective. No iron is used in the rails, which are made of heavy poles jointed together. All that is necessary is a good even grade and a logging locomotive, the surface of the wheels of both locomotive and car being concave (similar to a pulley wheel) have a flange on each side of the rail, which adjust themselves readily to any slight inequalities of roadbed or track. The road will be 17 miles long.

SOUTH DAKOTA.

RAPID CITY CHLORINATION PLANT.—Deadwood *Pioneer*: When M. H. Day returned from California to Rapid City a few months ago he conceived the idea of having the chlorination plant at Rapid City started up on Bald mountain ores. He quietly secured an option on the plant, which had been sold at sheriff's sale, and on a number of claims around Bald mountain, and then went to Boston to enlist capital. A stock company has been organized in Boston and money enough has been paid in to secure the mill, and the mines will all be taken before the bonds expire. The mill, which it is estimated cost from $80,000 to $150,000, was secured for $20,000, and the mines are all bonded for about the same proportion of their value.

COLORADO.

A BUSY OFFICIAL.—The county clerk at Colorado Springs says that over one hundred papers per day pertaining to bonds and leases in that district are being filed for record.

ARIZONA.

The National Mining Development and Brokerage Company, with headquarters at Portland, Maine, has bonded the Swiss Girl group of copper mines for $25,000. These mines are located twenty miles east of Prescott, two miles from the Black Canyon road. The new company will start work in the 54-foot shaft of the Swiss Girl and sink it to a depth of 154 feet, will build wagon roads and put the camp in shape for active work. At the same time development work will be pushed on the Alice, another claim of the group. A smelter and general reduction works is also contemplated, as ore from Chaparral, Big Bug and the Bradshaws is all tributary to this point. The works will be on the Agua Fria, where water is abundant and the S. F. P. & P. fourteen miles away.

YAVAPAI COUNTY.

THE GOLDEN NUGGET.—The Burke Mining Company has incorporated to operate the Golden Nugget mine and adjacent placer claims in Big Bug district. The incorporators are D. A. Burke and B. J. McQuin of Prescott. The Golden Nugget is developed by two shafts, each over 70 feet in depth and each shaft showing a vein of ore five feet in width.

PIMA COUNTY.

At NOGALES.—There was filed last week a deed from W. J. Cheyney, of Abecon, N. J., to the Montana Camp Gold Mining Company to two mining claims, the Montana Camp mine and the Philadelphia, in Oro Blanco district. The consideration is $580,000, payable in stock at $2 per share.

MEXICO.

SONORA.

THE MINAS PRIETAS ROASTERS.—The new roasters at the Minas Prietas mill operate upon tailings taken from the dump conveyed to the top of the roaster building, above the mill, by a wire rope tramway, dumped on a receiving floor; thence passed to a drying floor, consisting of plates of iron laid at the top of the back end of the furnace, there pulp is mixed with five per cent of ground salt, turned once while in that part of the process; when completed it is shoveled into carriers on each side, which convey it to elevators. The latter empty the pulp into bins, whence it is fed into the roasters by automatic feeders. The roasters are large iron cylinders, sixty-two inches in diameter and thirty-six feet long. They are revolved by a gearing of cog wheels connected with a three-horse power engine, and can be made to travel fast or slow, as to the length of time desired to subject the pulp to the roast. The roasted pulp falls through the furnace to a chamber below, whence it is conducted to a cooling floor. Thence it goes to the battery pans in the mill. The two roasters handle each fifty tons of pulp daily.

ECUADOR.

THE PLAYA DE ORO.—Jno. P. Petty, who was recently at Nevada City and Grass Valley looking for experienced miners to go to the Playa de Oro mine, in Ecuador, S. A., sailed last week for the property, where he will act as general manager. It is a New York company and has recently completed a very large hydraulic plant, having a capacity of 5000 inches, expected to wash from 15,000 to 25,000 cubic yards of gravel, with a daily output of $10,000.

The gold deposits in that district cover 200 square miles. There is an abundance of water, and the gravel is said to average 15 cents a yard. C. Van Issebot, chief engineer of the Ecuador Gold Mining Company, adjacent to the Playa de Oro, is on his way to that property with a view of overseeing the installation of the plant now being constructed in this city, and to be sent to Ecuador by the 1st of January.

Until Americans acquired the property the Indians and negroes have been washing out the gold in small quantities in their bateas or wooden dishes, and have supplied their wants in that way for 150 years.

The Government of Ecuador is now constructing telegraph lines, which will soon put these properties in direct communication with New York and San Francisco.

These placer fields are looked upon with great interest by the Government, which has issued a special pamphlet describing these properties, known as Bulletin No. 64, the only document of the kind ever issued by the United States Government.

A Question Answered.

Under date of November 30 a subscriber writes from Siskiyou county:

Would you kindly answer the following questions in an early issue? We have an ample water supply about one and three-quarter miles distant. What pressure, and horsepower, will be developed at lowest point (terminus) through 15-inch pipe with 170 feet pressure? Also, number of inches of water available for delivery through same, no elevations en route? Also, like questions applied to a 6-inch pipe, one and three-quarter miles long, and 170 feet pressure?

[Fifteen-inch pipe, 9240 feet long, 170 feet head: maximum, 59.6 H. P.; 368 cubic feet per minute; 115 feet effective head. As applying to 6-inch pipe: 6.4 H. P.; 39 cubic feet per minute; 115 feet effective head; efficiency of water wheel, 75 per cent. The paragraph, "Power for Mills," page 372, this issue, also applies to the matter.]

Coast Industrial Notes.

—No California-made boiler has ever been known to explode.

—The Canadian seal catch for '95 was 69,595, a decrease of 27,879 from the catch of '94.

—A 10-cent rate between San Francisco and Vallejo has temporarily demoralized the retail trade of the latter city.

—The number of idle men in this city is increasing, due, mostly, to the present low rates of travel between here and Oregon.

—Oakland will hold an industrial exhibition beginning the 16th inst., at which the industries of Alameda county will be fitly represented.

—The Southern California Railroad will extend its lines nine miles, through Elsinore to the coal and clay mines, and connect with the main line at South Riverside.

—Gen. Craighill, Chief of Gov't Engineers, reports the completion of twenty-five casements for defense and asks $100,000 additional for submarine mines and appliances.

—H. T. Scott of the Union Iron Works has signed a contract with Secretary of the Navy Herbert for building gunboats 14 and 15. The cost of 14 will be $219,000 and of 15 $223,000.

—"A pine needle industry" sounds singular. At Grant's Pass, Or., a factory is to be established to make oil, wool and soap from the needles of the pines which abound there.

—*Bradstreet's* reports 43 failures in the Pacific Coast States and Territories for the week as compared with 19 for the previous week and 23 for the corresponding week of 1894.

—F. M. Smith, "the borax king," has bought the narrow gauge California and Nevada railroad. The announced price is $150,000 cash. It is said he will extend it to Walnut Creek.

—On the S. F. and S. J. V. R. R. track is laid six miles from Stockton. About 150 men are employed in construction work. A temporary track will soon be laid across the San Joaquin. The road to the Corral Hollow mines will be completed by Feb. 1, '96.

—San Francisco's new City Hall is in process of completion. The cornerstone was laid nearly twenty-five years ago—Feb. 22, 1871. The construction has been delayed and the structure, like all similar buildings, has cost twice as much as it would or should have cost private parties.

—The San Francisco demand for Los Angeles oil justifies the erection of large tanks, which will be located at the Potrero. One 35,000-gallon tank will soon be in place there. Others of lesser size will be built. The Exchange is now shipping by rail to San Pedro, but will shortly pipe the oil to that point and put on a tank steamer to carry it from there here.

—It is proposed to organize "The Bend Power Co.," with $500,000 capital stock, to establish an electric plant on the Merced river above Horseshoe Bend. A concrete dam thirty-five feet high is projected at the latter point, the water to be conveyed thence by ditch and flume, 1½ miles, giving 93 feet fall; it is calculated 1800 H. P. can be developed at the lowest stage of the Merced with a minimum of 4000 H. P. The idea is to furnish power to all the mines of the district. H. H. Clark of Coulterville and F. M. Hopkins of this city have present charge of the proposition.

—Travertine from Inyo county will be a portion of the California structural material in the new fifteen-story building to be erected corner Third and Market streets, this city, and marble will also enter largely into its composition. This State possesses some of the finest beautiful marbles. The California "sienna" marble is of a rich, yellowish tint with markings of sepia; the "Ramosa," a gray ground with dark markings like those in a moss agate and rust-colored blotches; "white and gold," well described by the name, but with fine moss markings; "black and gold," having delicate white streaks. Chemically these marbles are very pure dolomite, close-grained and compact, and equally well adapted for exterior and interior work. They are susceptible of a very high polish. They are said to crush at 36,000 pounds pressure.

—Charles S. Reeves of Tacoma has evolved this plan for the defense of Puget sound: He would, at the entrance to the sound or at the most advantageous point near Port Townsend, have a steel cable laid across from shore to shore, having attached to it a cast-iron magnet sixty feet square, wound with the requisite thickness of insulated wire. The magnet would be placed below the water, and in the track of incoming ships. To the ends of the cable would be attached electric dynamos of large capacity, and through wires connected to the magnet a powerful current would be conveyed, making the huge instrument an attraction to steel warships passing over it that could not be resisted. In other words, the scheme would be to draw the invading fleet, vessel by vessel, below the waters of the sound, electrocuting the officers and crew, and making the valuable armament the property of Uncle Sam.

—Work on the Alameda and San Joaquin railroad, or as it is commonly known, the Corral Hollow road, is being pushed ahead. It is completed for six miles out from Stockton and track is being laid at the rate of a mile a day. The road is all graded to the mouth of the Corral Hollow canyon, through which for a distance of six miles there is some heavy grading, but it is expected that the road will be completed to the coal mines and be ready for operation by the first of March next. The first construction train over the road pulled out from Stockton at 2 o'clock on the 3rd inst. and consisted of two cars of rails, three of ties, and two flats devoted to invited guests, some 200 in number, among them the mayor and city council of Stockton. The train remained two hours, during which time a large force of men were at work and over a quarter of a mile of track was laid. The road is now within eight miles of the San Joaquin river which will be reached in a little over a week. A temporary trestle-work bridge crosses the river, and it will be replaced by a steel drawbridge before spring. The work on the road is of the best description and is evidently intended for permanent business. The ties are close, and the rails are 56-pound Bessemer steel.

—A very interesting pipe line has just been constructed and laid by the Risdon Iron and Locomotive Works for the North Star Mining Company of Grass Valley. The diameter of pipe is 20 inches, and is 7000 feet in length. The working pressure at the lower end of pipe line is 300 pounds per square inch. The heaviest material used was ⅜-inch steel, and the lightest—some 2500 feet at the head of pipe line—was No. 9 B. W. G. steel, the pressure on portions of the lighter pipe being 225 pounds. At the lower end of the line a receiver 24 inches in diameter by 40 feet long was constructed, the connection to pipe being made with cast steel flanges. The receiver is provided with one 12-inch branch leading to Pelton water wheel and one 8-inch relief valve. The air chamber is 18 inches in diameter by 20 feet long, made of lap-welded pipe with ends riveted in. This sets on top of receiver, with 4-inch connections and shut-off gate. It is also provided with inlet air valve and check valve and water-gauge column, including two pressure gauges reading to 500 pounds. The material used in receiver is ⅜-inch mild open-hearth steel; and it will be interesting to engineers to note that when the line was completed and the test pressure of 400 pounds per square inch applied, the pipe and receiver not only successfully withstood the shock, but they were bottle-tight. It is claimed that this pipe line is working under a heavier pressure than any riveted pipe heretofore constructed on the coast. A. D. Foote, who is the consulting engineer of the North Star Mining Company, designed the entire plant, and the construction at the shops, as well as the laying of the pipe, was under his immediate supervision.

Personal.

A. B. PAUL has returned from Sierra county.

C. D. LANE is bonding mining properties in New Mexico.

JIM WARDNER is figuring on further developments at Kennedy, Nev.

GEORGE E. AMES of the Union Iron Works has returned from Montana.

J. V. KEELEY has returned to Vanderbilt district, San Bernardino county.

HENRY JANIN left here this week for London, where he will remain all winter.

LOUIS WEBB of Siskiyou sails for South Africa this week, to join his brother Harry.

A. H. WALRATH has gone to Brown's Valley, Yuba Co., to take charge of the Old Flag Mining Co.

DR. ADDISON, of the General Electric Co., has returned from a pleasant sojourn on the Atlantic coast.

J. B. TONKIN, formerly of Salmon River, is now foreman of the Iron Mountain mine, Shasta county.

J. J. HILL will resign the presidency of the Great Northern on 31st inst. to accept that of the N. P. R. R.

JOSIAH GILBERT is now general mine superintendent of the Butte & Boston and Boston & Montana companies.

V. C. GRAY, formerly of Shasta county, has returned to the superintendency of a mine near Mazatlan, Mexico.

DR. FRED H. HATCH has returned from London to Johannesburg, S. A., to resume his work as mining engineer.

CARL SNYDER of New York is here preparing an article on California's gold mines and mining for *Harper's Weekly*.

IRVING M. SCOTT is the subject of a pleasant biographical sketch, with portrait, in the current number of *Cassier's Magazine*.

HERBERT LANG is located at Shasta, Cal., and has charge of the new furnaces building at the Risdon Iron Works for the Mountain Mining Co. at Keswick.

CAMILLO CERRUTI left here this week for Paris, France, where he purposes establishing a bureau for the representation of California mining properties.

WILLIAM IRWIN, formerly of Bodie, has acquired wealth by mining investments in Australia. Henry Callaghan, formerly of Nevada county, has charge of one of Mr. Irwin's properties at Brown's Creek.

R. H. DUNCAN, general superintendent of the Merced Falls Electric Power and Manufacturing Co., is at Merced, and announces his intention to put in a plant at Merced Falls, where sufficient power exists to meet the wants of that section.

C. P. HUNTINGTON is to arrive at Coatzacoalcos, Mexico, next week, to take a trip over the National Tehuantepec Railroad, with a view of leasing or purchasing the property from the Federal Government, which now has it in successful operation.

COLONEL MCROBERTS, promoter of the Merced and Yosemite Railroad, has returned from Mariposa county. He says the surveyors are in the field above the Horseshoe bend, are compiling a report of the entire route, and making estimates of every fill and cut between Merced and the Yosemite valley.

H. P. GORDON, of Plymouth, Cal., is now superintendent of a new hydraulic mine at Minersville, Trinity Co. He was for over a year foreman of the North Bloomfield mine, and has mined in Montana, Oregon, Idaho, Costa Rica, U. S. of Colombia and Ecuador. He still thinks California is the miner's paradise.

Scientific Progress.

Cyanide of Potassium in Hardening Tool Steel.

Discussing the use of cyanide of potassium for steel-hardening purposes, T. R. Almond, Brooklyn, N. Y., suggests this salt assists the hardening process because of its powerful dioxidizing properties, and also because it forms a liquid film on the surface of the steel, which causes a more perfect contact between the steel and the water, thereby permitting a more rapid abstraction of heat. The inevitable formation of a thin coat of oxide is unfavorable to the process of rapid cooling; and as rapid cooling seems to be the one thing necessary for success as to hardness, any means used for the removal of a bad conductor of heat, like the black oxide, will be of advantage, and more especially if this means also results in the formation of a liquid film on the steel surface having the affinity for water which, it is well known, is peculiar to potassium cyanide. Mr. Almond recommends the removal of all scale or oxide from the surfaces of steel to he hardened, either hy pickling or by the cyanide. Steel covered with a very thin film of oxide will take the heat less quickly when immersed in hot lead than if the steel be hright before heing immersed. This being the case, it would seem to follow that, because of a film of oxide, heat will leave steel more slowly when being cooled by water.

Shops producing their own tools exclusively are becoming scarce. Homemade contrivances are giving place to machinery perfected hy specialists and installed on the purely business principle that they will lower the cost of the product. Making a special study of the needs of each industry has not only furnished better tools but decreased their cost in corresponding proportion. The machine shop that would undertake to huild a lathe or horing mill for itself would find itself greatly handicapped in the matter of cost, when compared with the regular tool works. But even leaving the question of first cost aside, how would the home product compare with that of a firm making a business of building such tools? Would it give the same degree of efficiency with the same expenditure of power?—Cassier's Magazine for December.

The work of the Coast and Geodetic Survey on the Alaska boundary has so far progressed as to the line hetween Alaska and British Columhia as to show that there will be very little change from the line run by Ogilvie, the British surveyor, in 1889. The line crosses Forty Mile creek ahout eight miles from the mouth of the Yukon river, which will leave a portion of the gold fields in British Columbia. The question of ten marine leagues from the sea coast as to the eastern boundary is more difficult, but the United States will not recede from the position that it must be computed from the maiuland and not from the islands.

Scientific progress on this coast will receive considerable impetus if it be brought about that Dr. Harkness will vacate the presidency of the California Academy of Sciences in favor of Prof. Jordan. "Superfluous lags the veteran on the stage" might long have been applied to the incumbency of the former gentleman, whose mental habits were not conducive to progress in the institution which so far has greatly failed to come up to popular anticipation or fill the functions prescrihed hy its founder, Jas. Lick.

For hygienic purposes, the floors of the hospital wards in Lyons, Fraiuce, are covered with a solution of paraffine in petroleum, which gives them a hrowu tint and makes them impervious to "everything." A single application is said to last two years. Thus prepared, the floors can be wiped daily with a damp cloth, moistened with some antiseptic solution. The floors of schoolrooms, barracks, etc., and of private houses, when uncarpeted, can he treated in the same manner with advantage.

New Electric Caustic Soda Process.

A new process for the manufacture of caustic soda and hleaching powder promises to give long desired results. Hitherto caustic soda and bleaching powder have been produced hy au old process, which has from time to time heen improved. By this process, caustic soda could not he produced for less than $30 per ton, or bleaching powder for less than $27 per ton. The new method is said to reduce the cost of manufacturing caustic soda to $21; and of hleaching powder to about $15. There is, however, a further economy. The ordinary quality of caustic soda corresponds to what is technically known as 70 per cent Liverpool test, whereas the soda produced hy the new process answers to 78.5 per cent, Liverpool test. The new system is hased on the employment of a moving hody of mercury, the amalgam of which is decomposed electrically as soon as it is formed. The cells employed are, it is stated, only one-fifth the size used in any other process, actual or proposed. A stroug point in the new method is that it requires very little lahor, being almost entirely automatic.

Photographs are now printed by the hundred by machinery. Starting with the roll of sensitized hromide paper, which is unwound in a room illuminated hy red light, fed under two or more negatives to which it is automatically pressed, and at the same time exposed hy the flashing of incandescent electric lamps above the negatives, then moved along the proper distance for a fresh section to be exposed and finally wound up on another roller. The roll of exposed film is next removed to another room and automatically developed, moving from one roller to another through the different dcveloping baths, fixed, alumed, washed and dried, the fiuished pictures being wouud on a final roll, ready to be cut to size and mounted on cards the usual way. Its capacity is 245 "exposures" of cabiuet pictures a minute.

The telephone system now in operation in the United States has deharred one-half million messenger boys from earning a living; the type-setting machines have displaced thirty thousand printers; the pneumatic cash carriers in stores have dispensed with the services of ten thousand cash boys and girls. A few years ago ten thousand girls rolled the cigarettes now made by machiuery. The cable and electric lines of railway of the country have rendered useless millions of horses and mules, and thrown out of employment thousands of men whose duty it was to care for them.

Dr. Gustav Eisen has published an account of his receut explorations in the cape region of Baja California, which throws considerable light on that comparatively unknown land. The accompanyiug maps differ from former ones as to mountain chains, their direction, etc., and are presumably correct. The doctor collected nearly 1000 new forms of animal life, and his book adds largely to the sum of knowledge of that peninsula.

It is figured that if the street-car service now in operatiou in the city of Chicago were effected by horses, as formerly, it would require 30,000 horses, 3000 stablemen to take care of them, 1500 blacksmiths to shoe them and 5,460,000 bushels of oats and 1,000,000 tous of hay to feed them annually.

Compressed air is now proposed as a motor in street-car service in this city and Oakland. It is in successful use in some eastern and central cities.

Mechanical Progress.

A New Clock Dial.

The new dial represented herewith is an improvement on the old patterns. The inventor started out with the idea of making the hour hand traverse the dial in the same time that the sun on the average traverses, or seems to traverse, the path around the earth.



It will he seen that the dial represents the rising of the sun, its progress to the zenith at nootide, and to its final disappearance below the horizon at nightfall. But the disc, instead of heing divided into twelve spaces, is divided into twenty-four, marked from one to twelve in two series. The upper half of the dial represents day, and the lower half night, and the two are distinguished hy the very natural expedient of making "day" white and "night" hlack, with the additional precaution of printing "day" and "night" in conspicuous letters on the respective hemispheres. On the outer rim will be observed the scale for the minute hand. This scale is divided into sixty parts, every fifth part being marked with its appropriate figure. This, again, does away with a source of ambiguity in the present system. People are accustomed to say "a quarter of" and "a quarter after," or "twenty-five minutes of," all of which expressions have a greater or less tendency to cause mistakes. By the new dial there can he no errors. Take, for instance, the position of the hands as represented in the diagram. They mean a certain time, and no other time. The small or hour hand is hetween five and six, and as this hour hand represents the sun, we see that it is sinking toward the horizon. In other words, it is between five and six o'clock in the evening. The precise time is known when we look at the long or minute hand. This is poiuting directly at fifty-five. The time is, therefore, five hours and fifty-five minutes in the evening, or five, fifty-five, as railroad men say. According to the common method of telling time you would say that the diagram shows five minutes of six o'clock, P. M.

Another improvement connected with the day-and-night clock dial is an invention to simplify the reading of time tables by incasing the figures that indicate the arrival and departure of night trains in heavy hlack. Everybody who has had occasion to travel has suffered the tortures of the time table. Most women are absolutely unahle to fathom the mysteries of a train schedule. The trouhle is mainly caused hy the little "A. M.'s" and "P. M.'s" that are coustantly springing up in the most unexpected places and in the most distressing manner. The new arrangement does away with this difficulty at one blow. If all railroads should adopt the new system, it would almost be a pleasure to read time tables. There is absolutely no chance for error. And then not only would the reading of the schedule he an easy matter, but the traveler "of the long voyage" could see at a glance just how much time his trip will occupy, and what part of it will be performed at night and what part in the daytime.

The most curious thing ahout this invention is that it has never heen thought of hefore. But in that respect it resembles a great many other important discoveries.

Tubes Made from Solid Metal.

Advance sheets of a consular report hy Consul General Mason, at Frankfort, give a description of the Erhardt process of manufacturing tuhular bodies out of solid metal, without casting, boring or welding.

A cuhe of steel is heated cherry red, and dropped into a massive matrix of the outward form required. A mandrel is then thrust forward hy immense hydraulic pressure. It enters the steel cube, and presses the metal outward to fit the depressions in the matrix. Owing to the force exerted, the metal yields like butter, and gives an exact impression of the hollows in the matrix.

The advantages of this treatment are the uniform strength and consistency given to every part of the article produced, with the utmost lightness compatihle with sufficient strength to endure necessary strains.

Already the German Government has adopted this method of making the outer casing of shrapnel shells, to the exclusion of all methods formerly in use.

The process has also been applied to the manufacture of gun barrels, hollow flasks for containing liquefied carbonic and other acids, and parts of machinery where lightness and strength are desirahle.

It may also he applied to the manufacture of hollow ware, and its usefulness is not confined to articles made of steel. Wrought iron, copper and other malleahle metals are susceptible of the same treatment, the only condition heing that each metal should he worked at the temperature which insures its greatest amount of malleahility and ductility. Seamless copper tuhes of twenty feet in length have already heen produced with commercial success hy this process.

In the old method of horing the solid hlock it often happened that the strongest and densest part of the metal was turned into shavings. Under the Erhardt process this is impossible, as the compression gives the finished block au equal and uniform density, without seams or flaws.

Wire Measuring Machine.

A wire measuring machine has heen constructed for the use of wire manufacturers, contractors and others who may require to keep a constant check on the quantity of wire or cable payed out or reeled in. It consists of a strong but light steel wheel, mounted on a cast iron frame, and having a fine worm cut on the spindle geared into a worm wbeel. This drives a train of clockwork connecting the hands of the dials which indicate units, tens and thousands of feet or yards, or meters, according to requirements. To prcvent error due to slipping, there is a small roller on the top of the wheel upon which the length to be measured runs. This roller presses the wire or cable onto the wheel. This machine would prove a great convenience, as by means of it cables and wires can be automatically measured during or after process of manufacture, or before being sent out for a temporary task, as well as after they are returned. Adjustable contacts can be fitted to the dials to ring a bell when any desirable length has passed.

J. W. Powers of Minneapolis, Minn., is aunounced as having invented a steam engine in which he is able to entirely dispense with the dead center. "The engine will start from any position." Mr. Powers claims that, in his, a steam gauge put in the head of the cylinder will show exactly the same register as the gauge upon the boiler. He will probahly modify some of his views later on.

Recent accidents here and in Oakland emphasize the necessity of constant care on the part of workers with and among machinery. A machine has no intellect, no pity and must be handled with caution. In this regard "'tis better to be foolishly careful than carelessly foolish."

Electrical Progress.

Electro-Plating for Ships.

Electro-plating with copper the iron hull of an ocean-going tug is being done at Jersey City. The invention, it is believed, will solve the problem how to protect the hull from barnacles and corrosion. The hull of a wooden ship can be protected by nailing on sheets of copper, but this method cannot be used on an iron vessel. If the sheets of copper are bolted directly to the iron, galvanic action is set up by the salt water and the iron plates are eaten away.

The process consists in depositing a layer of copper upon the iron by means of tanks filled with a solution of copper and subjected to the action of an electric battery. These baths, three feet square and six inches in depth, are laid flat against the side of the vessel, shaped so as to fit the curvature and watertight by being jammed up against the iron hull and then packed with oakum round the edges. Three sets of baths are used in the process and the entire operation takes about two weeks.

The first bath is of sulphuric acid, which cleans the iron plates and prepares them for the deposit of copper. Twelve hours is sufficient for the cleaning process, when the baths are removed, cleaned and replaced on the hull, then filled with a solution of cyanide of copper, which, by means of pipes and a pump, is kept in constant circulation through the baths. The positive pole of a powerful battery is then connected with two copper plates placed in each bath and the negative pole to the iron hull of the ship. A thin layer of copper is soon deposited on the plates covered by the bath, which is called the sinking coat, and serves as a foothold for the copper deposited by the succeeding bath. After the cyanide has been removed from the baths, a solution of sulphate of copper is introduced, which acts in the same way as the cyanide solution. The action of the electric current which passes through the baths subtracts the metal from the copper plates in the bath and deposits it upon the striking coat obtained by the cyanide bath. When about three-sixteenths of an inch has been deposited the baths are removed and the coat of copper is thoroughly burnished. It is then in almost perfect unison with the iron plates and cannot be removed except with a cold chisel. Heavy blows with a hammer do not produce any impression upon it and it is practically part of the iron.

A Rubber Craze.

One of the most interesting of current events, from the view-point of the electrician, is the newly developed production of rubber in Lagos. In 1893 no imports of this article were recorded as received from the colony, and last year the amount was only $29,970: By a single steamer, which left Lagos at the beginning of last month, however, the value of the rubber shipped to Liverpool was $75,000. The new industry has taken hold of the inhabitants of Lagos indiscriminately with the rush of the gold craze. Numbers of clerks, small traders and others, even, it is said, professional men, have packed up their traps and gone into the interior to take their chances in collecting and manufacturing the gum. The native owners of forests have a shrewd appreciation of the bearing of this unwonted excitement, and are insisting on the payment of royalties. Some of them are even entering into the business of preparing the rubber for the market. Prices in the interior have been considerably advanced, and there is no longer as much profit as there was at first in purchasing and transporting the product to the coast. The fear among electricians that an artificial rubber would have to be resorted to in consequence of the increasing scarcity of the natural product has, for the present at all events, been allayed. In many rubber sources the wholesale destruction of trees by the natives has been stopped, and odd kinds of rubber are cropping out from unexpected quarters. Several new sorts, together with the familiar little black balls with a white center, come from the West Coast of Africa. A new product comes from Madagascar. It has a horny appearance and contains much earth. Nothing certain is known of its botanical origin.

An Electric Jib Crane.

An electric jib crane, constructed under American patents, is doing good work in conjunction with a 3-horse power bipolar motor, and lifts with case a weight of over two tons. The electric current is obtained from the lighting circuit of the works. The economy of this electrical application is shown by the fact that when the crane was worked by hand power, and with the usual chains and bars required in handling steel billets, it took six men one hour and a half to do that which is now done by three men in one-quarter of an hour. This electric crane is also used for unloading boiler plates. These are often 4½ feet wide, 22 feet long, and weigh 1500 pounds. The special advantage of this form of crane is found to be its adaptability for the quick moving of all forms of heavy masses of iron and steel. It is of great service not only in the handling of ingots, bars and plates, but in the speedy manipulation of iron and steel goods in a more finished condition.

An electric plant is being put in for lighting the business portion of New Wilmington, Pa., to be operated by a 20-horse power gasoline engine, in connection with dynamos and with storage batteries. This is said to be the first plant of its kind in the United States using the three-wire system in connection with a gas engine and storage battery.

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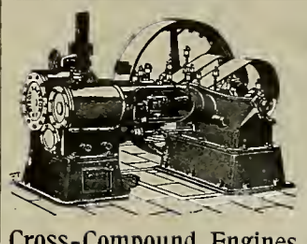
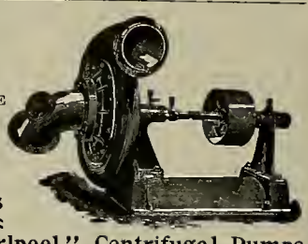
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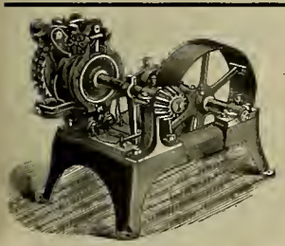
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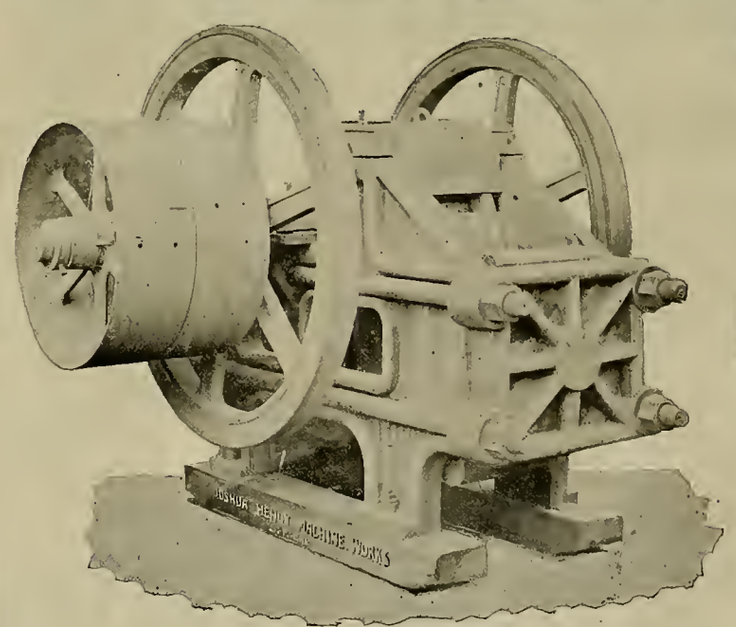
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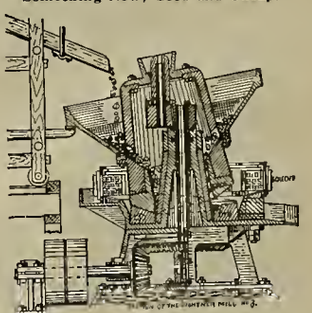
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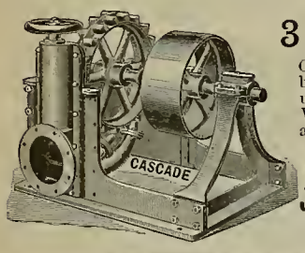
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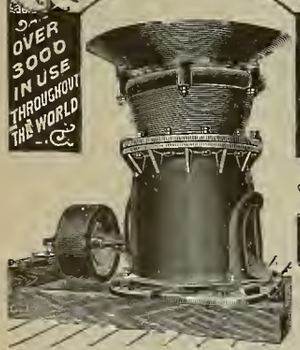
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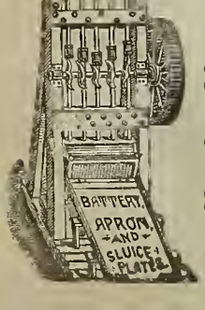
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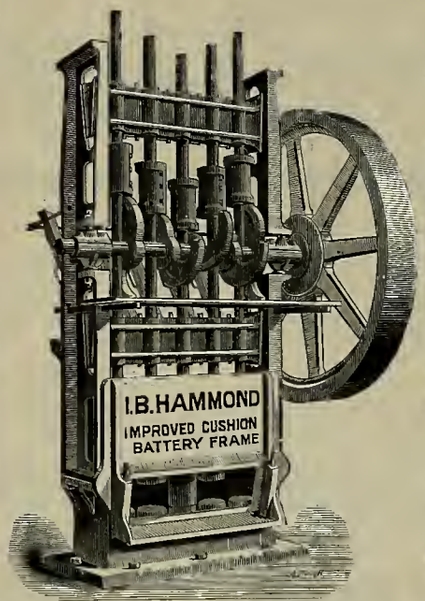
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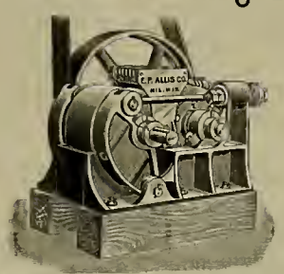
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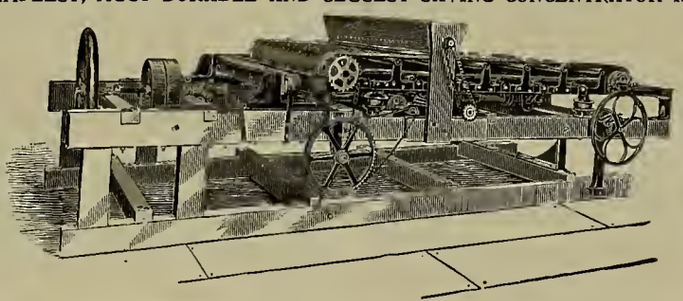
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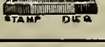
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The Markets.

SAN FRANCISCO, Dec. 5, 1895.

There is a dullness in all the metals except lead, which shows considerable life. The market generally is unsettled. Under date of Nov. 18th, James Lewis & Son's report on copper, from Liverpool, says: "A combination of adverse circumstances has brought about a decline of £1 7s 6d per ton in the value of good merchantable copper since the 1st inst. The lower range of values is mainly due to the steady and continuous selling of American copper for delivery over the next eight or nine months, as well as of good merchantable copper on American account. It was thought that support would have been given to the market by the firms largely interested in Anaconda, Boleo and Rio Tinto shares (the former having sold at £5 10s and the latter at £15), but this has not been forthcoming. American exports for the first half of November are 2150 tons. Stocks have decreased 4014 tons, and the visible supply 3538 tons, during the past fortnight. Imports to date are 5772 tons less, and deliveries 5514 tons greater, than last year. The arrivals in England and France for the fortnight have been 2835 tons, and the deliveries 6849 tons. The arrivals of Chili in Liverpool and Swansea have been 250 tons, and the deliveries 1976 tons, and from other countries 1550 and 3411 tons fine respectively. The arrivals in Liverpool and Swansea from the United States have been 133 tons bars and 644 tons matte, equal to about 497 tons fine, and in France 175 tons fine. The Chili charters for the past fortnight are advised as 900 tons, and exchange 17⅝d. No sales of furnace material have been made public. Quotations to-day are: Chili bars and good merchantable copper, £43 15s for cash and £44 2s 6d for three months' prompt; English best selected ingots, £48 5s to £48 15s, and tough cake, £47 10s to £48 per ton; ore of 20 per cent, 8s 6d; regulus and matte, 8s 9d per unit."

New York Metal Market.

NEW YORK, Dec. 5.–PIG IRON—Southern, 12@13.00; Northern, 12@14.00.

COPPER — Brokers', 11c; exchange, 10.80c.

LEAD—Brokers', $3.30; exchange, $3.20.

TIN—Straits, 13.75@14.25c.

SPELTER—Domestic, $3.55.

New York Silver Prices.

NEW YORK, Dec. 5.—Following are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.
Friday	30¾	67⅛	11 00	.....
Saturday	30⅝	67⅛	11 00	3 15
Monday	30⅝	67	.....	3 20
Tuesday	30½	67	.....	.....
Wednesday	30⅝	67⅛	11 00	3 25
Thursday	30¼	67¼	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sigbt Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.88
London Merchants	$4.86½
London Sigbt Bankers	$4.89½
Refined Silver, per oz., 1000 fine	67¼c
Mexican Dollars	55c

San Francisco Metal Market.

COPPER.

Boit, ¼ & 5-16, 20c; ⅜ and larger, 21c			
Lake Superior Sheathing	22	@	—
Ingot, jobbing	—	@	18
Ingot, wholesale	17	@	1
Sheet copper	—	@	21

ZINC.

Sheet	9½	@	

LEAD.

Pig	—	@	3 90
Bar	—	@	4 25
Sheet	—	@	5 50
Pipe	—	@	4 75

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 20
Drop, B and *larger* sizes, "		"	1 45
Buck, Balls and Cbilled, do, "		"	1 45

IRON.

American Soft	16 00	@	18 00
Pig, per ton	18 00	@	20 00

STEEL.

English, lb	16	@	19

COKE.

Gas Companies'	75c	₱	bbl.
English, to load	9 00	@	10 00
" spot, in bulk	—	@	13 00
" in sacks	—	@	15 00
Cumberland	9 00	@	— —

ANTIMONY.

Per lb	—	@	10½

PIG TIN.

Per lb	15	@	16 00

QUICKSILVER.

Home trade, per flask	39 00	@	40 —

BORAX.

Refined, in car lots	—	@	5½
Refined, in sacks and barrels	—	@	5¾
Powdered, in car lots	—	@	5¾
Concentrated, "	—	@	4⅞

TIN PLATE.

Per bx	5 25	@	6 00

ZINC.

Sheet	8½	@	

NAILS.

Wire			$3 50
Cut			3 25

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fiuming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

Mining Share Market.

SAN FRANCISCO, Dec. 5, 1895.

The market has shown more activity. While there seems to he more life, yet the outside puhlic are slow in taking hold. This is due to the vast majority having been so hadly victimized on the long sides through false moves; they fear to venture in until the market acts as if moneyed men, not scalpers, are handling it. The former want good sized deals, but the latter are content with small gains. It is also said that quite a number of outsiders still hold good lines of shares—waiting to unload at high prices. So far as can be ascertained there is nothing yet developed in the mines to justify insiders coming in openly and operating on the hull side. It is easy to send the market up with money hacking, hut it is not so easy to unload, for dealers are scarce, unless the proposition is hacked up hy more merit in the miues than has been found, or at least so far as the public knows, at any time within the past seven years.

The upmove reported last week in Occidental did not last long, for the shares soon set off again. Then Bodie came to the front and made one of its characteristic fake moves, but this upmove seemed to have stirred up the Occidental people, for the market value of the shares in this mine douhled in quick order on a street report of ore strikes, which caused the shorts to fill and which also brought in a few of tbose outsiders who are always anxious to take a "flyer" for fear of being left. But it did not last, for prices soon broke. On the upmove the balance of the market sympathized slightly, hut there was lacking an element of strength, which does not indicate stahility. The assessments heing collected will tend to keep the Comstocks down, for those holding shares become sellers just before they become delinquent, besides there are always short sellers at hand prepared to sell so as to make assessments. This is against the market.

The news from the Comstock mines is far from discouraging. On the contrary, it is quite encouraging from one end to the other of the lode. In the Alta group active exploiting work is still the order, hut much of it seems to he in the nature of not making any development until the work is further advanced on tbe different levels. This applies to the other groups as well as to the Alta group. From a gambling point of view, it is not right; but from a legitimate business standpoint, it is thoroughly correct, for there have been too many disappointments and heavy losses hy outsiders to warrant mine managers doing anything to excite the cupidity of dealers unless the development in the mines bave heen shown hy work to justify it. In the Gold Hill group the work is still to the west. It is heing prosecuted on several levels, whicb looks well for the future, provided miners' expectations regarding the west lode are realized. Several of the mines are extracting a few tons of ore daily, which meet part of the expenses at least. In Alpha there has heen quite an improvement, hut for reasons hest known to the management it is not fully made public. Prohahly after more work has been done, so as to see if it is something of importance, it will be given out. The improvement is to the west and ought to favorahly offset both Con. Imperial and Exchequer. Perhaps there are too many shares of the two latter out on the public to admit of their appreciating much in value. In the middle mines they are digging away, while lawyers down here are digging away in the Hale & Norcross suit. The latter have the advantage in keeping the shares depressed and not selling as high as the prospects in the mines warrant. While the work is being pushed to the west on several different levels, yet every favorahle showing is followed up to see what it will lead to. A few tons of ore are extracted each day, with Potosi turning out the largest quantity. In Gould & Curry and Best & Belcher the work is still of an uninteresting character to outsiders, hut to miners it is full of interest. In Con. Virginia, Ophir, Mexican, Union and Sierra Nevada the work is similar to that heretofore reported; hut as it is prosecuted interest should increase correspondingly. It is reported, and on seemingly good authority, that the north-end group of mines are in splendid condition, and that an improvement has taken place in one or more. As the work is in the right direction, it would not be surprising if the rumors are correct; yet, until they are verified from official sources, conservative and well informed mining men will not venture an opinion, let alone operating in the shares on the strength of the reports. In Andes the work is more or less overlooked by the outside puhlic, yet it is quite important.

From the Brunswick lode the news is quite important, still it does not justify huying the shares of the mines on that lode, except for a gauhle. There is nothing reported so far which warrants buying, with the hope of securing anything more than assessments. The work is now largely of an exploiting character and something of value may he found, hut time alone will disclose it. The work heing done deserves close watching.

From the outside mines there is nothing of interest to report. The work in the mines in the Columhus and Tuscarora districts is unattractive. In the Bodie district, work still continues of a kill-time character while making a bluff at doing something very important. More assessments will have to he levied in this group. When work is extended to the lower levels there will he every prospect of something quite important heing found in one of the mines at least.

The following is the usual monthly statement of moneys on hand:

BONIE MINES.		E. Sierra Nev..	$	29	22
Bodie	$14,256	07 Excbequer	3,187	53	
Bulwer	969	68 Gould & Curry	1,321	29	
Mono	1,672	56 Hale & Norc'ss	5,158	17	
Standard	20,411	73 Julia	684	34	
Syndicate	1,078	17 Justice	1,219	23	
WASHOE MINES.		Kentuck	5,432	74	
Alpba	$ 9,265	38 Lady Wash'n	239	41	
Alta	6 043	45 Mexican	1,567	15	
Andes	5,477	12 Occidental	2,716	64	
Belcher	7,786	34 Ophir	1,393	46	
Best & Belcher	968	44 Overmân	1,147	30	
Bullion	361	57 Potosi	23,580	17	
Caledonia	1,593	45 Savage	6,956	27	
Challenge	529	02 Scorpion	32	74	
Chollar	2,250	59 Seg. Belcher	6,060	74	
Confidence	1,453	03 Silver Hill	449	30	
Con. Imperial	3,808	85 Sierra Nevada	12,339	04	
Con. New York	493	36 Union Con	9,194	45	
Crown Point	3,787	61 Utah	2,778	88	

The Con. Cal. & Va. has unsold bullion on hand, subject to discount, valued at $35,422.79, and owes $22,408.05.

The Silver King Mining Company of Arizona had an indebtedness of $5719.61 on November 30th.

The following illustrates the changes of the week:

MINES.	Nov. 28.	Dec. 5.
Alpba	$ 38	$ 21
Alta Consolidated	19	14
Andes	.....	23
Belcher	29	30
Best & Belcher	69	83
Bodie	.....	45
Bullion	12	20
Cballenge	30	.....
Chollar	28	.....
Confidence	90	.....
Consolidated California and Virginia	2 30	2 20
Consolidated New York	.....	.....
Crown Point	30	26
Exchequer	.....	.....
Gould & Curry	34	28
Hale & Norcross	1 20	96
Justice	07	05
Mexican	44	.....
Ophir	1 20	1 05
Overman	14	.....
Potosi	65	60
Savage	45	.....
Sierra Nevada	67	64
Union	59	53
Utah	.....	.....
Yellow Jacket	25	.....

San Francisco Stock Board Sales.

SAN FRANCISCO, Dec. 5, 1895.

9:30 A. M. SESSION.

100 Alpba	20	200 Gould & Curry	27
200	21	100	28
100 Andes	23	300 H. & N	96
200 Belcher	29	650 Potosi	60
400 Best & Belcher	82	600 Occidental	75
100	83	50	73
600 Bodie	45	200	74
50	44	50	76
400 Bullion	20	100	77
100 C. C. & Va	2 20	300 Sierra Nevada	62
2250 Con. Imperial	02	100	63
400 E. B. & B	08	200 Union	53

SECONN SESSION—2:30 P. M.

200 Ophir	1 05	200 Sierra Nevada	64
450 Gould & Curry	28	500 Union	51
550 Best & Belcher	82	100 Alta	14
100 Con Cal & Va	2 15	300 Occidental	77
100	2 20	600	78
100 Potosi	59	30	80
50	58	200 Benton	45
600 Hale & Norcross	93	600 Bodie	41
100 Crown Point	26	300	42
300 Alpha	21	300 Justice	05
300 Belcher	30		

Assessment Notices.

BEST & BELCHER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors held on tbe fourth (4th) day of November, 1895, an assessment (No. 59) of twenty-five cents (25 cents) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, No. 309 Montgomery str et, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the ninth (9th) day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

M. JAFFE, Secretary

Office—Room 33, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Assessment Notices.

BULLION MINING COMPANY. — Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 4th day of November, 1895, an assessment (No. 46) of ten (10) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 20, No. 331 Pine street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of December, 1895, will be delinquent and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

R. R. GRAYSON, Secretary.

Office—Room 20, No. 331 Pine street, San Francisco, California.

SUPERIOR MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Placerville, El Dorado county, California.

Notice is hereby given, that at a meeting of the Board of Directors held on the fifth day of November, 1895, an assessment (No. 1) of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 916 Market street, Room 81, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 9th day of December, 1895, will be delinquent and advertised for sale at public auction; and un ess payment is made before, will be sold on WEDNESDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

J. HOWARD BARNARD, Secretary.

Office—Room 81, 916 Market street, San Francisco, California.

THE JAMISON MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, on Jamison Creek, near Johnsville, Plumas County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the ninth day of November, 1895, an assessment (No. 7) of two cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 120 Sutter street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of December, 1895, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on MONDAY, the 6th day of January, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

SAM W. CHEYNEY, Secretary.

Office—Room 50, 120 Sutter street, San Francisco, California.

GOLD BAR CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 5th day of November, 1895, an assessment (No. 2), of three cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Rooms 37 and 38, Crocker Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of December, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on THURSDAY, the 16th day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. C. GODFREY, Secretary.

Office—37 and 38 Crocker Building, San Francisco, California.

GOULD & CURRY SILVER MINING COMPANY. Location of principal place of business, San Francisco, California; location of works, Virginia, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1895, an assessment (No. 77) of Fifteen (15) Cents per share was levied upon the capital stock of the corporation, payable immediately in United states gold coin, to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 10th day of December, 1895, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on MONDAY, the 30th day of December, 1895, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block. No. 309 Montgomery street, San Francisco, California.

CON. CALIFORNIA & VIRGINIA MINING COMPANY. — Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the 22d day of November, 1895, an assessment (No. 5) of twenty-five (25) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 48, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of December, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on THURSDAY, the sixteenth (16th) day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. W. HAVENS, Secretary.

Office—Room 48, Nevada Block, No. 309 Montgomery street, San Francisco, California.

CONFIDENCE SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 13th day of November, 1895, an assessment (No. 26) of 30 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the sec etary, at the office of the company, No. 414 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of December, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on WEDNESDAY, the 8th day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

A. S. GROTH, S cretary.

Office—No. 414 California street, San Francisco, California.

WANTED.—POSITION AS ASSAYER OR Amalgamator. Capable to take charge of mine and mill. Over 25 years experience.

C. S. A., 1212 So. O Street, Tacoma, Wash.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Deling't and Sale.	Secretary.
Best & Belcher M Co, Nev	59	25c	Nov 4, Dec 9, Dec 30	M Jaffe, 309 Montgomery
Bullion M Co, Nev	46	10c	Nov 4, Dec 9, Dec 30	R R Grayson, 331 Pine
Bulwer Con M Co, Cal	11	5c	Oct 29, Dec 4, Dec 31	C E Elliot, 309 Montgomery
Con Cal & Va M Co, Nev	5	25c	Nov 22, Dec 28, Jan 16	A W Havens, 309 Montgomery
Confidence M Co, Nev	26	30c	Nov 13, Dec 18, Jan 8	A S Groth, 414 California
Chollar M Co, Nev	41	25c	Nov 12, Dec 17, Jan 7	C E Elliot, 309 Montgomery
Exchequer M Co, Nev	38	5c	Oct 21, Nov 25, Dec 19	C E Elliot, 309 Montgomery
Gold Bar Con M Co, Cal	2	3c	Nov 5, Dec 21, Jan 16	E C Godfrey, Crocker Building
Gould & Curry S M Co, Nev	77	15c	Nov 5, Dec 10, Dec 30	A K Durbrow, 309 Montgomery
Iowa Mining Co, Nev	21	5c	Oct 23, Nov 26, Dec 16	R L Tbomas, 419 California
Jamison M Co, Cal	7	2c	Nov 9, Dec 16, Jan 6	S W Cbeyney, 120 Sutter
Marguerite M Co, Cal	1	10c	Nov 2, Dec 2, Jan 5	Cbas. Winters, 237 12th St., S F
Mexican M Co, Nev	53	25c	Nov 19, Dec 23, Jan 14	C E Elliot, 309 Montgomery
Ophir S M Co, Nev	67	25c	Nov 5, Dec 9, Dec 30	E B Holmes, 309 Montgomery
Overman S M Co, Nevada	74	10c	Dec 2, Jan 6, Jan 27	G D Edwards, 414 California
Superior M & M Co, Cal	1	5c	Nov 5, Dec 9, Dec 30	J Howard Barnard, 916 Market, S F
Yellow Jacket M Co, Nev	60	25c	Nov 12, Dec 17, Jan 22	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date
Andes S M Co, Nev	J W Twiggs, 309 Montgomery	Dec 18
Gould & Curry S M Co, Nev	A K Durbrow, 309 Montgomery	Dec 16
Ophir S M Co, Nev	E H Holmes, 309 Montgomery	Dec 18

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING NOVEMBER 26, 1895.

550,433.—ABDOMINAL SUPPORTER—Annie L. Babington, Oakland, Cal.
550,244.—MINING APPARATUS—C. Bingburn, S. F.
550,363.—FRUIT WASHER—G. W. Deane, Riverside, Cal.
550,493.—TRUSS—J. Fandrey, Santa Barbara, Cal.
550,410.—GAS GENERATOR—A. Harding, Oakland, Cal.
550,347.—TRAIN STARTER—J. T. Langlais, Berkeley, Cal.
550,515.—GOLD-SAVING APPARATUS—A. S. Laszkievicz, Martinez, Cal.
550,517.—CONCENTRATOR BELT—W. J. Loring, Angels Camp, Cal.
550,397.—CLAMP FOR BANJOS—W. A. Todd, S. F.
550,426.—WAGON LOADER—G. M. Wallace, Yuba City, Cal.
24,923.—DESIGN—V. A. De Prosse, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

CHILIAN MILL.—Martin P. Boss, San Francisco, Cal. No. 550,038. Dated Nov. 19, 1895. This mill consists of crushing wheels, a vertical shaft by which their travel is effected, and means for connecting the wheels to the shaft, comprising a vertical sleeve feathered upon the shaft and adapted to move freely vertically, said sleeve being formed with integral gudgeons, one ou each side of the axles of the crushing wheels, each having an integral partial hub which, when fitted together, forms a complete journal-box to receive the gudgeons of the sleeve, and means for uniting the sections of the hub and for rotating the shaft. This mill is set in a frame which carries the overhead bearing of the vertical shaft, said frame comprising stringers having the bearing of the shaft and supporting walls, and an ore bin anchors said stringers upon one of the walls.

MEAT CUTTER.—Wilhelm Hundenborn and Adolph Backhausen, Elherfeld, Germany. Assignors to Siegmund Kohlberg, of same place. No. 550,071. Dated Nov. 19, 1895. This invention relates to that class of meat cutters in which the material is fed to knives mounted upon a perforated disk rotating in a vertical plane. The device consists of a casing or shell formed into two cylinders in planes at right angles to each other, one of the cylinders being the feeding cylinder and the other the cutting cylinder. The feeding cylinder has a supply hopper, and has one of its sides flattened. A roller is mounted eccentrically within the feeding cylinders and operates closely against an abutment or wall formed at the junction of the two cylinders at one side of the center only, whereby an opening is formed below the abutment for the passage of the material from one cylinder to the other, said roller having a slot made diametrically through it and extending approximately the entire length thereof. A single pusher plate is mounted to freely slide in said slot of the roller, and cutting disks are mounted in the cutting cylinder which operate in planes at right angles to the rotation of the roller.

AXLE GAUGE.—Rufus A. Simpson, Ferndale, Cal. No. 550,061. Dated Nov. 19, 1895. This invention has for its object to provide a gauge for accurately measuring the dish, as it is called, of a wagon wheel, and for use in indicating the set of the axle to correspond with any given dish of wheel. It consists of bars pivoted together, having fixed and adjustable plates extending transversely across them and projecting beyond the edges of the pivoted plates and adapted to rest upon the wheel rim at opposite sides, an adjustable plate intermediate between these transverse plates having an arm adapted to rest upon a central spoke when the others rest upon the rim, so as to give the dish of the wheel a transverse gauge and pointer forks, which indicate the dish, and arms having forks which diverge outwardly from the centers of the sides of the pivoted bars, so as to clasp the axle and retain it in a central line of the bars while the gauge is inspected to ascertain the set of the axle.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from Wm. A. Roberts and John Graham, in the Forest Home mine, Amador county, to impound tailings behind a dam in Arkansas creek; from James T. Ish, in the Bull Neck mine, near Volcano, Amador county, to impound tailings in dry ravines; from Henry Dickerman et al., in the Mill Gulch mine, near Amador, Amador county, to impound tailings behind a dam below the mine; from John G. Ramm, in the Jay Bird mine, near Camptonville, Yuba county, to impound tailings below the mine; from Schillanskey & Co., in the Wild Yankee mine, Shady Run, Placer county, to impound tailings behind a dam in a ravine; from W. H. Cole, in his mine in Mountain Tp., El Dorado county, to impound tailings behind dams in a dry ravine; from A. B. Jacks and John Clifford, in the Badger Hill mine, near Spanish Ranch, Plumas county, to impound tailings behind a dam in Woods Ravine; from John Schafer, in the Pine Leaf mine, near Spanish Ranch, Plumas county, to impound tailings in an old pit; from Geo. C. Sargent, in the Quaker Hill mine, Nevada county, to impound tailings on a flat south of Deer Creek; from James Meehan, in his mine near Aquednct City, Amador county, to impound tailings below the mine; from J. N. Findley, in the Trafton mine, near Yankee Jims, Placer county, to impound tailings in a ravine below the mine; and from George W. Smith, in the Irish Hill mine, near Oleta, Amador county, Cal., to impound tailings behind a dam in a ravine—gives notice that a meeting will be held at Room No. 82, Flood Building, San Francisco, Cal., on Dec. 23rd, 1895, at 1:30 P. M.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Certi.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4,000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special monthly meeting held on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on November 2, 1895, the above sale is postponed to MONDAY, the 2d day of December, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on December 2, 1895, the above assessment is postponed to TUESDAY, the 31st day of December, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

ANNUAL MEETING.—THE REGULAR ANNUAL MEETING of the stockholders of the Gould & Curry Silver Mining Company will be held at the office of the company, room 69, Nevada Block, 309 Montgomery street, San Francisco, California, on MONDAY, the 16th day of December, 1895, at the hour of one o'clock, P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer books will close on Friday, December 13, 1895, at 3 o'clock P. M.

ALFRED K. DURBROW, Secretary.

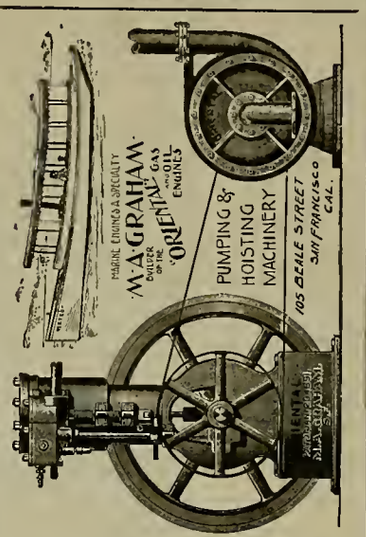
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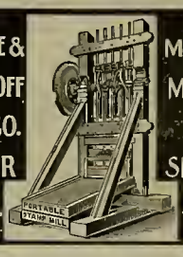
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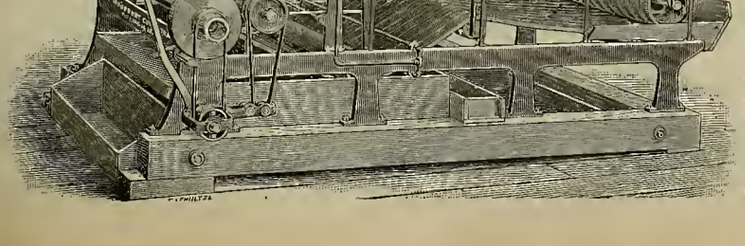
CHARLES C. MOORE, Pacific Coast Agent, 32 FIRST St., SAN FRANCISCO, CAL.

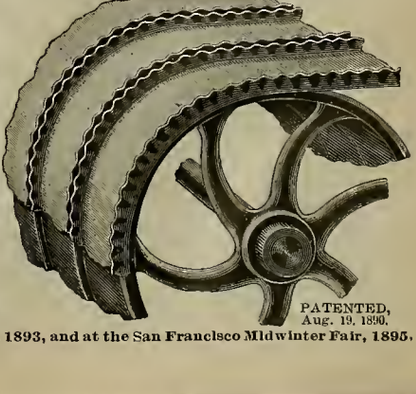
THE WOODBURY ORE CONCENTRATOR WITH IMPROVED BELTS was awarded the Highest (Bronze Medal) Premium at Mechanics' Institute, 1890 and 1891.

the space of any other concentrator. Built of best Steel and Wrought Iron. Strong and durable. Price $575 f. o. b. Send for Catalogue and Testimonials.

The annexed cut shows the belt in its improved form, which consists of corrugated edges, to form an expanding top edge. THE IMPROVED MACHINE HAS THE FOLLOWING MERITS: First—The Improved belts, which consist of seven, are constructed and arranged so as to allow each belt to receive a portion of the pulp in such a manner as to relieve the machine of its load, thereby giving it twice the capacity of other concentrators, and enabling it to work from 12 to 15 tons of ore per day. Second—The machine equalizes the load by several compartments, thereby working more regularly and with much less attention than is necessary to give other concentrators using wide belts. Each of the belts on this machine takes care of the pulp that is allowed to it—in this way preventing the pulp from running to the lower side of it, as is the case when a machine becomes out of level where wide belts are used. Third—The belts run on a perfect line, needing no adjustment to prevent their running from side to side, as in other concentrators. Fourth—The belt surfaces are improved by indentations and corrugations, causing the Concentrator to save fine sulphurets and quicksilver, and perform close work. Fifth—The belts have fluted or corrugated edges, to form an expanded top edge, which effectually prevents from cracking. Sixth—The feed arrangement is perfect; Seventh—The machine is constructed of iron, with steel crank-shaft self-oiling boxes, and everything made in the most thorough manner, enabling it to run with very little attention or wear.

Geo. E. Woodbury, Manufacturer, 141 to 143 First St. San Francisco, Cal.





PATENTED, Aug. 19, 1890.

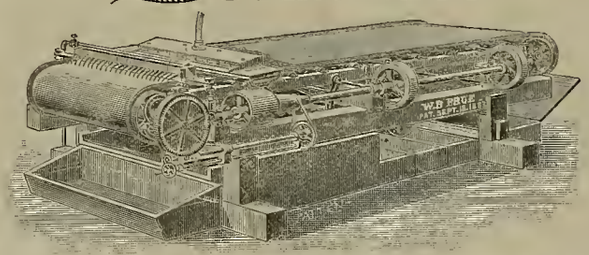
This Concentrator took the 1st prize at the San Francisco Mechanics' Institute in 1890, 1891 and 1892, and at the California State Fair in 1892; it took the 1st prize at the World's Columbian Exposition, 1893, and at the San Francisco Midwinter Fair, 1895.

FRUE ORE CONCENTRATOR.

OVER 4200 IN ACTUAL USE.

Manufactured under Patents of

April 27, 1880;
September 18, 1883;
July 24, 1888;
March 31, 1891.
July 18, 1893.



It can he safely stated, without going into a description of several new and untried concentrators that have lately come into the market, that where sulphurets are of such value as to make close saving necessary, the Frue Vanner is always used. It is the only endless belt concentrator in the market that can he relied on to handle all classes of ores, and give universal satisfaction. (In all competition of concentrators the Frue Vanner is taken as the standard machine of the world, and all comparisons made by it. There have been over 4200 of these machines sold, 1700 having been sold on the Pacific coast alone.) They are in use in every part of the world where mining is carried on and in all cases they are giving perfect satisfaction. From time to time valuable and important improvements have been made in this machine to increase its capacity and durability, and particular attention is called to the Patent Lip Flange for the rubber belt, which does away with nearly all the strain and cracking, as in the old style of flange, making the life of belt more than double that of other style belts in the market. The lip of flange bends outward in going over the large end rolls, thereby distrihuting the strain in the solid rubher, and bringing virtually no strain either at the edge or at the hase of flange, as is the case in all helts with a raised edge.

For any information, pamphlets, circulars or testimonials, call on or address

Price of 4-foot wide Plain Frue Vanner ..... $500, f. o. b.
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RISDON IRON WORKS,

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READ WHAT MINERS THINK OF THE BRYAN IMPROVED ROLLER QUARTZ MILL AND JOHNSTON CONCENTRATOR.

OFFICE OF THE CANDELARIA CONSOLIDATED MEXICAN MINING CO.,
SAN DIMAS, DURANGO, MEXICO. October 25, 1888.

RISDON IRON WORKS, San Francisco—Gentlemen: Our company has been operating three of the 4-foot Bryan Roller Quartz Mills, one of which has been runnl g steadily for three years, one for two and one for one year. Our quartz is very hard; we crush through a No. 60 mesh screen. Our mills run 55 revolutions per minute, and each crush through 60-mesh screens 12 tons in 24 hours; through 50-mesh, 15 tons; and through 40 mesh, 18 tons. This proportion has been continuous.

One set of dies will crush from 1500 to 1600 tons.
One set of tires will crush 1500 tons.
One ring plate will crush from 2300 to 2300 tons.

The mills require very little attention. At our mill an ordinary "peon," earning one dollar per day, has complete charge.

In regard to sliming, in comparison with stamps, by reason of the discharge surface and the continuous agitation by the scrapers, a MUCH less amonnt of slime is created. A three years' experience teaches me that, in every respect, the mills are a complete success, and of material benefit to the mining world. They can be set up and running in forty-eight hours and can be dismounted in the same time and removed to wherever desired. Ours were packed on our mule trail over as difficult a road as any in Mexico. As a gold ama gamator it is unequaled by any mill now in existence. Yours truly.

D. M. BURNS, Superintendent.

BULLION-BECK AND CHAMPION MINING COMPANY.
EUREKA, UTAH, August 24, 1895.

THE RISDON IRON AND LOCOMOTIVE WORKS, San Francisco—Gentlemen: Referring to contract made by you with the Bullion-Beck and Champion Mining Company, by which you were to furnish one 5-foot Bryan Roller Quartz Mill on four months' trial, in competition with the Huntington Mill, would say that we have made the test, and the Bryan Mill has proven so greatly superior on all points claimed, viz., capacity and economy, that we have ordered a second Bryan Mill from you and have concluded to discontinue the use of the Huntington Mill.

Yours truly. JOHN BECK. Pres.

SIMON BAMBERGER, Director. [Copy.] W. J. BEATIE. Sec'ty.

BULLION-BECK AND CHAMPION MINING COMPANY.
EUREKA, UTAH, Aug. 24, 1895.

THE RISDON IRON AND LOCOMOTIVE WORKS, San Francisco—Gentlemen: In February last, in connection with the five-foot Bryan Roller Mill which we took from you to test in competition with the Huntington Mill, we also took a six-foot Johnston Concentrator to be tested with ten Frues, one end shake with four belts and one side shake Woodbury. We have been working these machines since the mill was completed, at such times when we had sufficient water.

The terms on which the test was made was that the machine doing the most satisfactory work should be accepted and the others taken out. This did not apply to the Frue, as they were purchased with the plant. In compliance with this agreement, we now inform you that the Johnston Concentrator has proved so superior over the other machines that we now order from you four more of the Johnston Concentrators. Yours truly,

JOHN BECK, Pres.

SIMON BAMBERGER, Director. W. J. BEATIE. Sec'ty.

GREAT SALT LAKE AND HOT SPRINGS-RAILWAY.
S. BAMBERGER, President and Manager.
SALT LAKE CITY, UTAH, October 10, 1895.

B. R. TAWNDRAW, ESQ., care Glyer Hot Springs, Ketchum, Idaho—Dear Sir: In reply to yours of the twenty-eighth of September, we have been using at the Bullion-Beck Concentrating Works, Frue Vanner, Woodbury and Johnston machines, side by side for the last four months; and after a thorough trial of all of them, we concluded that the Johnston Vanner was doing the most accurate work and was the best; hence, we bought four more Johnston machines and shall continue to use them in preference to any other.

You will find it the easiest regulated machine and very much easier set up than either of the other machines. We bought our machines from the Risdon Iron Works, of San Francisco, where Mr. Johnston, the patentee, personally superintends the manufacturing of them.

Hoping you will make a success, I remain, Yours truly.

[Copy.] [Signed] SIMON BAMBERGER.

THE GOLD VALLEY MINING COMPANY OF SAN FRANCISCO.
C. C. McIVER, President; D. CUSHMAN, Secretary.
MISSION SAN JOSE, CAL., Oct. 17th, 1895.

RISDON IRON AND LOCOMOTIVE WORKS, San Francisco—Gentlemen: We take great pleasure in having to inform you that, after a careful investigation extending over a six weeks' steady run alongside of six other concentrators, the Johnston which you put in for us was the only machine from which you could not find a loss in the tailings. It has done all you claim for it and has proved more than satisfactory. We intend replacing all our other concentrators with Johnston's, as we are convinced they will pay for themselves many times over in a year. CHAS. C. McIVER. President.

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MINING AND MILLING MACHINERY,

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MINING AND SCIENTIFIC PRESS.
AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 24.

SAN FRANCISCO, SATURDAY, DECEMBER 14, 1895.

THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

Power From Ocean Waves.

How to utilize wave power has been the effort of many. To such effort is added one more modification of the old idea by a company recently organized here called the Wave-Power Air Compressing Co. "to compress air and distribute power." Herewith is illustrated the proposed mechanism. The intent is to do away with the necessity for using coal or other fuel in the generation of electricity by utilizing wave-power compressed air, conducting it to engines operating dynamos for electric power. Fig. 1 shows the perspective of eight proposed air pumps; figure 2 is a longitudinal section through one of these eight; in it the sub-figure 5 is a vertical section of one of the air pumps D and part of an air pipe G, showing the check-valve g and receding valves g^1, g^2, g^3, g^4, the guide bars k and the universal joint n connecting piston m and piston rod o; 7 and 8 show the piston rod; 9, 10, 11, 12 the receding valve and the grooves in their rim; 13 is a plan of the piston; 14 the same, from underneath; 15 is a plan of the check-valve g, showing oil-holes and channel; 16 is a plan of the air pump, showing the guide bars k and the valve-seats.

Figure 3 is intended to represent the stationary framework, being a detail of a part of Figure 1, built in uprights, of piles, driven into position in pairs and stiffened by horizontal timbers, the idea being to make it a part of a pier, breakwater or wharf.

The general scheme of utilizing wave power has been tried again and again; it has never been wholly satisfactory; something usually breaks down, or gives out, and the wave force that is relied upon to give efficiency to the whole thing generally breaks some of the apparatus when sufficiently forcible to have any effect at all. That wave power may some day solve the problem of cheap power is possible; that the apparatus here briefly outlined will do it does not appear probable. At present it is but a curiosity. A model of the air compressor is on exhibition at 602 Market street, this city. The projectors have incorporated and say that with $25,000 a 500 H. P. section of air pumps can be built. Their plan of raising that amount is to have the public subscribe a first payment of ten cents per share on 250,000 shares of stock, which plan appears devoid of originality.

This is as much as can at present be said of this latest phase of a philosophical proposition. The projectors expect to be able to overcome all present objections to its practicability.

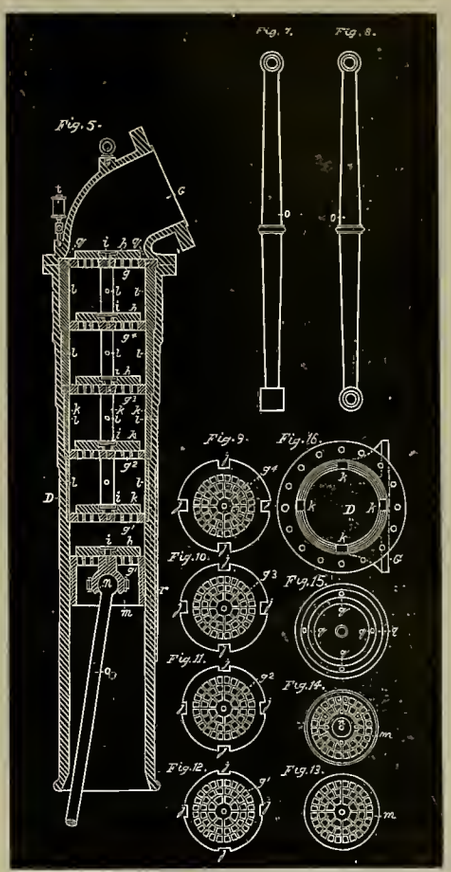


FIG. 2.—LONGITUDINAL SECTION THROUGH PUMP.

On page 388 appears the latest utterance regarding the selective action of cyanide. Meanwhile, the call for cyanide rings round the world, and despite the numerous published objections to the McArthur-Forrest patent and its workings, that company can answer by citing South African results.

"Light as air" is a common simile, yet under certain conditions air is heavy. Compressed to the degree noted on another page, at the Fort Point pneumatic battery, overlooking San Francisco harbor, a cubic foot of air weighs ten pounds. Ordinarily, at 50° Fahr., a cubic foot weighs 536 grains.

Prominent among the causes of the increased activity in gold mining, apart from the slump in silver and the hard times in other lines, is the fact that, as compared with twenty years ago, forty per cent more gold can be extracted from the same ore at thirty per cent less cost.

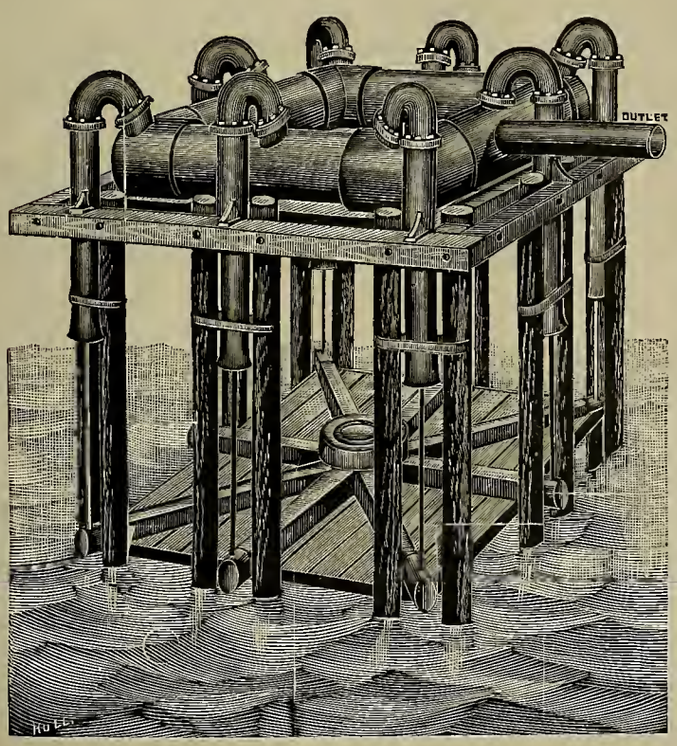


FIG. 1.—PERSPECTIVE OF EIGHT AIR PUMPS.

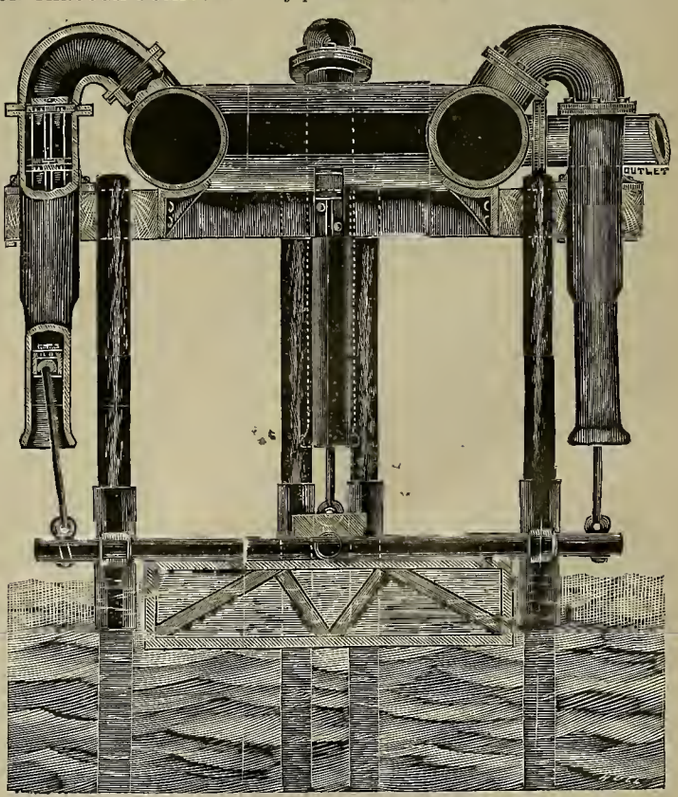


FIG. 3.—THE STATIONARY FRAMEWORK.

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J. F. HALLORAN.....General Manager

San Francisco, December 14, 1895.

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DESERVED commendation is given State Mineralogist Crawford for the admirably arranged statistical table by counties of the mineral product of the State for '94. The only improvement that could be suggested would he to get it out earlier in the year, but that is a matter largely in the hands of the State Printer.

DEADWOOD, S. D., is figuring on chemical works for the manufacture of chlorine and sulphuric acid. It is estimated there that sulphuric acid can be produced for $10 per ton, and chloride of lime $17 per ton. The *Review* reports the use of the chloriuation method greatly on the increase iu the treatment of the silicious gold ore of that section.

A CURIOUS sidelight is thrown on some conditions of some business in the quoted statement of an Eastern bicycle manufacturer that a wheel retailiug at $105 cost $27 at the factory; $30 to advertise it and $35 agent's commissiou, leaving $13 unaccounted for. The statement that it costs more to advertise a bicycle than to market it seems, however, to he an exaggeration.

THE Arizona *Journal-Miner*, published at Prescott, is doing good work for the mining industry of that section, by promptly exposing efforts to place mining property of douhtful value on inflated capitalization. Iu comment on one of the more recent of such efforts, it says: "Yavapai county has seen too many mouuments of failure erected on good meritorious properties, through mismanagement, stock-jobbing schemes and other causes, for her citizens to countenance and indorse anything that carries the impress of fraud on its face."

IT would be an advautage to miuers to have a uational uominating convention hold its session here, as that would be an opportunity to discuss this mineral land question at shorter range. One great trouble in having justice or equity in this matter is the inability of those who have the decision thereon to act understandingly. The most recent exhibition of lack of knowledge in this regard is the decision on petroleum lands in this State. Because petroleum is classed as a mineral land, and because mineral lands are daily patented as agricultural land, forms no reason for continued misrulings on those lands. As in the case of mineral—that is, metal-bearing land—oil lands should he withheld from agricultural entry. The hurden of proof should he on the agricultural claimant. To explain this across the coutinent is a difficult task. In this respect an occidental trip of a government land official, present or prospective, would be an important part of a liberal education.

THE origiu of mining items and their appropriation without credit is the subject of complaining comment from nearly every mining journal in the country. Experience and observation lead to the belief that the chief cause for such wholesale disregard of courtesy in this matter is that after any one has seen what he secured hy effort and expense appropriated without credit, he concludes after some time that he will do the same. Of course, this is not defensible, nor excusable, hut is a probable reason. These remarks are partly elicited by a Grant's Pass, Oregon, mining paper which complains that a recent item in an Oregon decision affecting the right to mine gravel bars first appeared in its columns, was then copied without credit hy the *Oregonian*, published at Portland, Or., and after more reproduction "found its way into the MINING AND SCIENTIFIC PRESS, its paternity still ignored." We would have been pleased to ascribe the proper paternity to the item in question, hut were unacquainted with its source. In a condeused form the gist of the matter appeared in "Conceutrates" as something worth attention. Its publication induced a communication (published on page 359 of the issue of Nov. 30th) which, it is helieved, will result in benefit to the mining industry of Oregon, and the correction of a prevalent abuse. Not until it was noticed in a journal of the circulation aud standiug of this one did the matter receive any attention. Meanwhile, if the Oregon mining journal originated the article that formed the basis of the few lines accorded the subject in "Concentrates," it certainly deserves all due credit therefor. "Crediting" matter is sometimes difficult, even where the desire to he just exists. Nearly every line in this paper is reproduced in other papers, yet hardly one-tenth of it is ever "credited" to its original source. This is not said in any spirit of criticism nor complaiut, hut is a simple assertion of existing fact. Any one and every one is of course welcome to copy, with or without credit, but good intent to indicate the original source is often thwarted. A case in point which illustrates our meaniug is furnished hy the *Sierra County Advocate*, published at Hillsboro, New Mexico. In its issue of the 6th inst. appear eleven "items" which were originally published in this paper. Ten of them are credited to a Denver mining paper. The Hillsboro, N. M., man douhtless desired to give credit, and naturally credited the paper in which he first saw the matter published. In this he differed from his Denver coutemporary. The general benefit to the mining industry resulting from accurate and reliable statements justifies their widest reproduction, adding to the common stock of knowledge; and while, of course, any one and every one likes to receive recognition, yet failure to duly credit should arouse no feeling of resentment, though it must be confessed it is often extremely annoying to see an article that cost time and money coolly appropriated without a word of credit; and when others recognize its value and republish it, credit the publication that chanced to first reproduce it, completely ignoring the journal that originated the matter.

BIGGER thau Belgium, of greater extent thau the province of Lorraiue, is the area in this State owned by one cattle firm; yet great as is that aggregation of millions of acres, in private ownership it is exceeded in extent and value hy the great South Africa Company, which owns a nation, deals with a continent, makes war, goverus, concludes treaties and exercises many of the rights usually associated with practical ownership. Cecil Rhodes and associates have temporary control of African territory of an extent equaling France, Germany, Austria and Italy combined—an area five times that of California. The company recently concluded a war in Matabelelaud, which was an incidental occurrence, a mere circumstance. Its greatest husiness is grantiug mining licenses: it does no mining itself, hut issues permits to other companies to mine in its territory, taking as rental 50 per cent of the vendor's share of the mining company's stock. It combines profit and patriotism and is in exact accord with British aggressiveness in Venezuela, Alaska aud other gold producing localities. So far it has spent £5,000,000 more than it has received, and will spend as much more, confident of gigantic profits later on. Under its auspices nearly three hundred prospecting companies have been formed; and should the prophesied extensive gold deposits be found scattered through "Rhodesia," the revenues will be great. In any event, the company's stockholders can so arrange as to offset any probable loss hy ulterior profit. In connection with gold mining, it is the most stupendous scheme of the century; like similar enterprises, it has the same relation to legitimate gold mining.

AT a meeting of the executive committee of the California Miners' Association at the Union League Club rooms in this city last Thursday night, hy an almost unanimous vote of those present a bill was endorsed to he presented to Congress "to provide for ascertaining aud determining the character of certain lands in the State of California." The hill as adopted is satisfactory to the S. P. Co. The original idea or intent was to present to Congress a hill similar to the Idaho-Montana bill, providing for the protection of mineral lands, hut in the judgment of the gentlemen present last Thursday night it was deemed advisable to adopt another measure. The hill adopted hy the committee will not suit the miners and does not meet the requirements of the occasion. Were it to pass and its provisions carried out, it would fail to be of material benefit iu the protection of the mineral lands from corporate effort to absorb them. The result is a disappointment to many who had hoped for a more satisfactory determination of this important question.

THE Secretary of the Interior, in a Montana case, decides that strict compliance must he made with the requiremeuts in making a location that the notices must he posted "in a conspicuous place." Because of their failure to prove that such notices were so placed three Butte locators have lost their claims, Secretary Smith reversing the finding of General Land Office Commissioner Lamoreux and sustaining the decision of the Helena land office. In extended comment the Secretary of the Interior lays great stress on the requirement that notices must be conspicuously placed, hut confesses inability to make a general rule as to how "a conspicuous place on a mining claim" can he defined. In the particular cases cited the evidence showed that none of the uotices were posted at any of the discovery shafts, nor near either of two traveled roads.

APPLICATIONS are still heing made for permissiou to work hydraulic mines in this State, twelve such applications being advertised in this issue. The hundred or more companies and individuals who have secured such permission have nearly all gone actively to work, the result being noticeable in the increased receipts of gold here. A very small percentage of those working hydraulic mines under the Caminetti act have neglected to keep their impounding works in proper condition, and their mines have been promptly closed down by the field assistants of the Debris Commission, who are constantly traveling round to see that the requirements have all been complied with. The commission is strict, but it is right, and the only complaint comes from the anti-debris people, who would complain still more were there really anything to justify objection.

IF, as some of our belligerent brethren declare, this country is "on the eve of a great foreign war," it is satisfactory to know that San Francisco has the most effective protective hattery in the country. Its successful trial this week demonstrated its superior efficiency, and insures its acceptance hy the Government. The air compressing machinery which furnishes the power was constructed by the Fulton Eugineering aud Shipbuilding Works of this city, which designed and built them under a competitive contract. It is the opinion of those most competent to form judgment that the dynamite battery at the entrance to this harbor can successfully defend this city from the hostile approach of any warship.

Concentrates.

MINERS at Mercur, Utah, have organized a union.

AND now Salt Lake proposes to have a Mining Exchange.

NOVEMBER'S pay roll on the Comstock aggregated $74,731.41.

BUTTE, Montana's, mining pay-roll now aggregates $800,000 monthly.

CLAIM JUMPERS are making considerable trouble at Rossland, B. C.

DEPUTY U. S. MINERAL SURVEYORS have about all they can do at present.

THE Nelson, B. C., *Tribune* predicts an output of $10,000,000 from Kootenay in '96.

"THE VIRGINIA CITY OF CALIFORNIA" is the term now locally applied to Coulterville.

THE Silver King, Utah, mine paid a $37,500 dividend last Saturday, making $450,000 to date.

IN Chicago it is proposed to have 100 men each put up $1000 to form a Mining Exchange "on a solid basis."

AN electric light plant is to be put in by Supt. Marcom of the Crnnde Ronde Mining Co. nt La Grande, Or.

GEORGE C. CAYLORD of Nevada City has bonded the Canada Hill Consolidated, and now controls tbat entire property.

THE company operating the Tulloch mine, Calaveras Co., bas been incorporated under the name of the Godbe Company.

NEVADA'S mines have produced over $600,000,000 in gold and silver, and as much more there awaits development and production.

A SOUTH AFRICAN mining engineer writes that the average gold extraction there is about 80 per cent of the assay value of the ore.

PLANS were prepared tbis week for the Morgan Mining Co., Park City, Utah, which is going to put in an entire new hoisting plant.

THE Northwestern Mining Association is to have an organ, a monthly magazine, entitled *Mining*, to be published at Spokane, Wash.

THE Victor Gold Mining Co., one of the steady producers of the Cripple Creek district, paid its usual monthly dividend of $20,000 last Tuesday.

NEAR Baker City, Or., the Bonanza mine produced $10,000 in November. Supt. Geiser says ten stamps will be added to tbe ten now at work.

EXCELLENT REPORTS continue to come from the Niagara mine, Sbasta Co. The lessees are making considerable money and the outlook is promising.

CAPT. COUCH, general manager of tbe Merced G. M. Co.'s operations in Mariposa, is nominated for Goveruor of Montana by the Butte *Mining and Railway Review*.

NEARLY all the idle men of Carson, Nevada, are reported to have work by the opening up of the Buckeye placer work. More men will be needed there next spring.

A PARIS mining syndicate wbich has bought some good properties near Bacoachi, Mexico, has decided to build a railroad to their mines from "Station 30," near Bisbee, Arizona.

A MINING CLAIM is not legally "known to exist" from the location thereof if the boundaries of the claim are not specifically marked on the ground and due notice of tbe location given.

WHEN a legal location of a mining claim has been made on land returned as agricultural, the return of tbe surveyor general is overcome and the burden of proof shifts to the party attacking the mining claim.

A NOTICEABLE difference between Idaho and Nevada mines is that on the latter the deeper the mine the greater the percentage of silver in the ore; in the former, the farther down the greater tbe gold percentage.

ARIZONA'S deepest shaft—1415 feet—is at the Congress mine, where nearly 400 men and a 40-stamp mill work continually. As at Keswick, in this State, no saloon is allowed within the limits of the company's property.

NEAR Bolinas, Marin Co., a two-foot copper ledge has yielded about forty tons, worth $45 per ton, which will be sent to Selby's. The expectation is that between Mt. Tamalpais and tbe ocean considerable copper will be found.

IN the Prescott, Arizona, District Court in the suit brought by C. W. Henry for the recovery of $150,000, claimed to have been expended by bim in the Henrietta mine under fraudulent representations, tbe jury has found for the defendant.

DURING November the Tacoma smelter produced 3200 bars bullion, weighing 327,983 lbs., containing: 1,175.58 ozs. gold, at $20.67, $24,299.24; 27,090.37 ozs. silver, at 67 cents, $18,150.55; 326,026 lbs. lead, at $3.20, $10,432.83; total, $52,882.62.

THE last issue of the Okanogan, Wash., *Outlook*, which formerly was filled with mining news, does not give one item regarding development in that region, or wbat is being done with mining properties that used to employ large numbers of men.

C. T. BANDMANN, former superintendent of the Pittsburg mine, tells the Crass Valley *Tidings* that there are good prospects that the Pittsburg will soon he sold to an English company, and that energetic work will be done on the property by next spring.

SOME Oregon journals think the gold statistics of tbat State recently published were too bigh for Union, Josephine and Baker counties. Exact data is bard to secure, but it is believed that the amounts given were in approximate accordance witb the facts.

THE Nelson, B. C., *Tribune* declares the following is a sample of the letters it receives from subscribers: "DEAR SIRS:—I am not dead, but am at work. My subscription has run out, but don't stop the paper. As soon as there is enough snow to rawhide ore I will makc a shipment, then pay up."

A KERN COUNTY man, T. A. Wells, visiting Coler, says: "Tbere are a number of peaks of quartz all the way from ten to twenty feet higb, and the rock pans $200 a ton. The claims appear to be a whole mountain of glittering wealth. At the foot of this mountain dry washers are making $10 a day, bandling tbe dirt tbat bas wasbed down from it. Tbe firm has been offered $80,000 for one of the smaller claims." That sounds wealthy, but it is a mistake to give such stories credence. There are some good prospects there, but such manifest exaggerations will not help that district, nor any district.

THE Lo Grande Oro placers at Silver City, Nev., are reported panning out $2 to the cubic yard. Experts say that the channel has carried the wash of the gold end of the Comstock for centuries and has been overlooked until recently. About forty men are now at work for the company.

MEN with new ideas about gold saving machines will find opportunity to exercise their ingenuity in the new claims located as placer near Johntown, Nevnda. The gold is exceedingly fine, mixed with much black sand and round iron stones from the size of a small shot to fifty pounds in weight.

THE Idaho State University at Moscow has established a department of mining, to teach men how to test ores so they can judge whether they have mines worth developing. There is no charge, except for materials used, which amounts to about $5 per month, and living expenses, $3.50 per week.

THE Secretary of the Interior has just decided that "a mineral entry cannot be allowed where the applicant fails to post the plat and notice of application in a 'conspicuous' place on the claim, and failure to comply with the statute in such particular will make new notice of the application necessary."

THE injunction of the Argonaut on the Kennedy Mining Company restrains it from taking ore from tbe land in dispute between the two mines until the suit now pending between the companies is decided by the court, but does not interfere with the work in any other part of the mine. The report that the mine has been sbut down is not correct.

DISCOURSING on Kaffir stock, the London *Statist* declares that the slump is stopped; that it will do good all round to bave some of the water squeezed out, and that the annual Rand gold output will increase from $40,000,000 to $100,000,000. Tbat, with Californiа, Australia et al., ought to produce enough "sound money" to satisfy even Clevelaud, Benedict and Carlisle.

THE first of the deep shafts to reach the ore at Johannesburg is the Celdenhuis Deep Level, which cut the conglomerate blanket at about 2500 feet. Tbe result did not come up to anticipations, but it is thought will sbow better when the plates are not so new. The Celdenhuis company has under construction a 200-stamp mill, and cyanide works for the treatment of tailings.

THE Canadian Government has let a contract for the carrying of mails from Juneau, in Alaska, to Forty Mile Creek, wbicb is also in the territory always claimed by the United States, but which Canada is now asserting a claim to. For a foreign country to let a contract for the transmission of mails in the territory of another Covernment is something unusual in international affairs.

AN Amador county prospector writes: "I am down in a shaft, rigbt on a ledge of quartz, only twenty feet, and the water is so bad I cannot go down any fartber. There are abont four buckets of water to one of rock. Can I make a syphon work?" If conditions are favorable a syphon will do till a depth of thirty feet is reacbed. Tbat is about the limit. If he intends going deeper a pump would be required.

WM. CHALMERS, of Fraser & Chalmers, Chicago, who has returned from South Africa, says: "The situation as regards the ownership of the mines and the present boom in Kaffirs may be summed up tbus: The English own the mines, the Americans manage tbem and the French and Germans are permitted to speculate in less than half of the stocks—less than half, observe, because the English are not going to relinquish the majority holdings at any price."

FROM W. P. Prisk, the enterprising proprietor of the Crass Valley *Union*, is received tbe *Nevada County Mining Review*, typographically superb and statistically valuable, giving favorable and authentic mention to the mines and miners of a county tbat has produced $75,000,000 from its quartz and $125,000,000 from its placer gold mines. No one who never tried it can appreciate the effort required to bring to a successful issue snch a publication as tbose bandsome 150 pages.

THE Butte *Inter-Mountain* compresses a column into seventy words, as follows: Cold mining, or in fact any other kind of mining, is now a highly scientific industry demanding capital and skill. A rich ore is by no means synonomous with large profits. Tbe presence of gold is a necessary element of success, but equally essential elements are tbe tractable character of the ore, tbe situation of the mine and the fuel and water supply. The problem is purely a commercial one.

SECRETARY OF THE INTERIOR SMITH has ordered the Commissioner of the General Land Office to suspend the furnishing of lists of selected lands for the Union Pacific and Central Pacific railroads to the Interior Department, which virtually stops operations in that office regarding the obtaining of patents on lands granted to these railways. The railroad companies bave been paid for most of the lands, but while the settlers have made their improvements thereon, they cannot get titles.

THEODORE FOX, in his suit for $1,500,000 against tbe Con. Cal. and Va. M. Co., the Comstock M. and M. Co., Jno. W. Mackay and Jno. P. Jones, was beaten in Judge Seawell's court in tbis city last Monday, judgment heing entered for the defendants. In another suit brought by the same plaintiff, questioning the right of tbe Con. Cal. and Va. mine directors to pay $50,000 to Supt. Patton as reward for services in putting out a fire in the lower levels of the mine, the court also found for tbe defendants.

CONTRARY to the usual wind-up of letters announcing "rich strikes," but concluding by warning all miners to stay away, "as there are more men here now than can find employment," F. J. Kelley of Bland, New Mexico, says that "tbe camp has 500 miners in it and not an idle one among tbem; that the wages are $3.50 per day, and tbat they cannot get enougb miners to do tbe work, and that if miners would come to that section they would find immediate employment." It is possible, but by no means probable, that the statement is so.

THE *Tribune* reports Manager Goss of the Cood Hope placer bas constructed a current wheel, tbirty-three feet in diameter, that will derive its power from tbe Colorado river. To the paddles of tbe wheel are attached buckets tbat dip and rise and dump tbeir contents at the rate of 125 miners' inches a minute, witb whicb be expects to bandle 1000 yards of gravel every twenty-four hours. "For years the threshing of the sands against the stupendous walls at Good Hope has created a measureless bar of auriferous concentrates that vary in their values from 80 cents to $3 a ton."

THE arrival of President Leonard of the Comstock Tunnel Co. on the Comstock is interpreted by the *Enterprise* to mean that the tunnel is to be extended to the Rock Island and West Point mines. There are two points where this extension might connect with the tunnel—in the Alta mine or in the Crown Point. By the former route the American Flat country would be accessible; by the Crown Point the tunnel would pass through an entirely new section that has been sufficiently prospected to proclaim its value, but is undeveloped.

IN the case of Hoskins vs. Curran, tho Idaho Supreme Court this week made a decision of interest to miners in that State. It virtually precludes the bonding of mining property in that State, or the execution of the bond for the deed. Tbe decision in effect is tbat a bond for a deed may be set up as a counter claim, which is probably the same as saying that the bond for a deed may be the subject of original action, even when the terms of the bond have not been complied with, and, by the ordinary wording of tbe bond, is void for noncompliance. The decisiou will result in the placing of deeds in escrow instead of executing bonds for deeds.

THE San Francisco Gold Mining Company has incorporated to develop the Golden Contact and Colden Circle claims in Cripple Creek mining district, El Paso Co., Col. The directors are: T. B. Everett, Denver, Col.; T. J. Parsons, C. W. Root, S. W. Backus, W. C. Ralston, G. Stone and F. W. Hinckley of this city. Capital stock, $500,000, fully subscribed, as follows: T. B. Everett, $100,000; T. J. Parsons, C. W. Root, S. W. Backus, W. C. Ralston, J. H. Neff, T. J. Nichols, J. Sonntag, B. T. Smitb, J. M. Miner, T. Flint Jr., $20,000 each; J. B. Fuller, P. Kilburn, $10,000; F. W. Hinckley, $30,000; C. St. Clair, $40,000; G. Stone, $110,000.

SINCE June 20, '92, the Colville Indian reservation has been opeu to mineral locations, and prospectors and mining men have neglected their opportunities only because tbey did not understand the law. That is the legal opinion of several attorneys who have given the matter mucb investigation, and, acting upon it, men have been prospecting for months on the reservation, and as a result of their discoveries have staked out their claims and had them recorded in the office of the Stevens county auditor nt Colville, Wash. It is said by well-informed persons that more tban forty such claims have been recorded already, and that tbese cover the pick of tbe mineral ledges crossing the liue from the Trail Creek district.

IN his introduction to Messrs. Hatch & Chalmers' work on "The Gold Mines of tbe Rand," John Hays Hammond makes the following remarks, which are approvingly quoted by all who believe in the deep level theory of Rand gold mining: "The feasibility of successful mining upon the area comprised by the outcrop and first row of deep-level mining companies is practically assured. It is to the mining of the deeper areas embraced within the second row of deep-level claims tbat I confine my remarks. Tbe problem is one of great importance, not only to the Transvaal, but to the world in general, for on its successful solution depends the gain to the world of an enormous gold output, as appears, if we accept the conservative estimate of £52,000 as the yield in gold per claim. Upon this basis it will be seen that every 1000 feet of vertical length, assuming the reef to be 36° in its dip, would open up ore from which £260,000 of gold would be obtained for every 150 feet, the length of one claim along tbe course of tbe reef. Every mile of ground parallel to the course of the reefs would therefore yield per 1000 feet of vertical depth the sum of about £9,000,000. The problem presented, then, is to how many thousands of feet in deptb can mining operations be carried in the Witwatersrand mining district? From an engineering point of view, mining operations are certainly practicable to a vertical depth of at least 5000 feet. Tbere is no necessity for abstract reasoning upon this point, as the practicability of miuing to these depths has been demonstrated in other countries. But, regarded from n financial point of view, will mining to this depth pay? The initial expense, as compared with that of mining upon tbe outcrop companies, will undoubtedly be considerably greater, on account of the increased cost of the heavier plant required and of the shaft sinking involved; therefore, it will be necessary in order to insure profitable mining upon such deep-level properties tbat larger areas be embraced in one company, so as to minimize the capital of expenditure per claim worked. If we work, for example, by means of deep-level plants blocks of 250 claims to the depth of 5000 feet, the extra cost per claim, as compared with the cost of the plants to work the outcrop companies, will not be more tban £1500 a claim, surely not a prohibitive expenditure if we bear in mind the fact that the profits per claim upon the central section are estimated at upwards of £18,000. As a matter of faet, the capital expenditure through faulty engineering in the case of the outcrop companies bas been considerably greater tban tbe estimate I bave allowed in this comparison of the relative costs of mining the outcrop and deep-level companies respectively. Tbe cost of mining would likewise undoubtedly increase compared with tbat of the most economically managed of the outcrop companies; but in my judgment these increased expenses would not, even under present economic conditions, greatly exceed those of tbe average mining costs of the outcrop companies. Tbe increased cost would be due chiefly to tbe larger expenses attending hauling, pumping and ventilation; but even under present conditions as to cost of labor and supplies the extra costs of deep-level mining to a depth of 5000 feet should not exceed 5s per ton; and tbis is obviously an insuperable obstacle to profitable mining. In my opinion there will be even less disparity of eost than this, owing to improved economies that would be effected by conducting the operations upon a larger scale than customary, by obtaining cheaper, or, in any event, wbat is equivalent, more efficient labor, both white and black, and by cheaper supplies. Therefore, looking to the time wben deep-level mining will be carried on extensively, we may reasonably predict sucb betterment of the economic conditions as to admit the mining of ore at the same working costs per ton as now obtain in the outcrop companies. Tbe successful working of these deep-level areas presupposes the persistency of the conditions of the blanket formation as to the widths and gold contents of the reefs. That such conditions obtain is evidenced by the geological character of the formation, and confirmed by the facts elicited tbrougb the actual workings upon tbe first row of deep-level claims, also from the deep-level boreholes."

"On the So-Called 'Selective Action'

Of Very Dilute Solutions of Cyanide of Potassium Used in Obtaining Gold and Silver from Ores and Other Compounds."*

By JAMES MACTEAR.

It has been stated in one of the MacArthur-Forrest patents that "in practice we find the best results are obtained with a very dilute solution, or a solution containing or yielding an extremely small quantity of cyanogen or a cyanide, such dilute solution having a selective action such as to dissolve the gold or silver in preference to the baser metals."

To most of those who have been engaged in investigating this process, or who have followed the recent litigation, the precise meaning of this assertion has been somewhat of a difficulty, the only definite explanation of which so far given has been the statement in the judgment of the Court of Appeals, here given verbatim that "a strong solution attacks the baser metals without attackiug the gold, whereas a weak solutiou is feeble and nil on the baser metals, but attacks the gold."

This, no doubt, seems to be a very definite assertion, but when one begins to examine the actual facts it is seen to be incorrect. As a matter of fact, no statement has ever yet been made—and supported by experiments—to prove that a strong solution "attacks the baser metals without attacking the gold," nor that the action of "a weak solution is feeble and nil on the baser metals, but attacks the gold."

The strongest claim that has yet been made and supported by experiment is uot that indicated hy the above quotation from the judgmeut in the Court of Appeals; but only that, as a general rule, a strong solution while dissolving the gold will also dissolve the baser metals, and that a weak solution in dissolving the gold will also dissolve the baser metals—iu both cases a much larger actual weight of base metal than of gold being dissolved, but in the case of the weak solution less base metal in proportion to the gold is dissolved than is the case with the strong solution—the ore submitted to the solutions, and the length of time during which the action of the solution upon the ore is allowed to continue, being the same in both cases.

It has been ingeniously argued, on the other hand, that while the "selective actiou" mentioned in the patent does not mean that strong solutions do not dissolve the gold, but dissolve the baser metals, and that weak solutions do dissolve the gold and uot the baser metals, it does mean that the proportion of gold to base metal found in the solution is generally much larger in the case of dilute solutions than it is in the case of strong solutious as used in the treatment of ores, and, therefore, the result is that a greater concentration of the gold is obtained by the use of dilute solutions.

In discussing the question it is necessary to bear in mind the fact that two types of action are involved. Firstly, the actiou of chemical affinity (a term most of us will be quite satisfied to use, although advanced chemists may consider it obsolete, as it is a convenient expression to explain certain chemical facts), and secondly, the action of such chemical affinity assisted or modified by an electric current.

Before dealing with these separately, it will be necessary to define what is meant hy the term used in the patent specification, "the haser metals."

It may be accepted that this term refers not to the baser metals in their metallic form, but in the form of their natural compounds as they are generally found associated with gold and silver in their ores. Were it otherwise, and the baser metals in their metallic form were meaut, then it is evident that the "selective action," as defined in the Court of Appeals, has no existence as regards the metals, but that the action is simply one of chemical affinity where the particles of metal are so placed in the solution that they do not form an electric couple. In other words, that the actiou is simply that of the cyanide solution upon the metals.

Experiments on the effect of cyanide of potassium solution on plates of the metals were made by Dr. Gore, aud the results of such experiments, with a solution containing 1.86 per cent of cyanide of potassium, equal to 0.74 per cent of cyanogen (within the limits given of very dilute solutions in the MacArthur-Forrest pateut, at 60° Fahr.), were published in the proceedings of the Royal Society, vol. 37, p. 284.

The table there given shows the absolute proportionate weight of the various metals dissolved or "corroded" from one square inch of surface in one hour. Taking the amouut of gold dissolved as 100 parts, the following are the proportions for the metals named:

Aluminum	1055
Zinc	600
Copper	588
Silver	177
Gold	100
Tin	66
Nickel	55
Iron	Trace
Platinum	Trace

It will be seen at a glance that gold is iu the middle of the table, and that aluminum, zinc, copper and silver are more readily soluble, or, in other words, the "selective action," so far as these metals are concerned, is in their favor, and against gold; while tin, nickel, iron and platinum are all less soluble, and as regards these metals the "selective action" will be in favor of gold.

Of all these metals, silver and copper alone may be considered as existing naturally in the metallic state in gold ores in appreciable quantity, and both of these are shown by the table to be more readily soluble than gold, and so far, therefore, the "selective action" of dilute cyanide solutions upon gold and the baser metals, where the action is not assisted by an electric current, may be dismissed without further consideration.

It is a very different matter, however, if we accept the wider interpretation of the term "the baser metals," and take it to mean the uatural compouuds of the baser metals as they are found with gold and silver in ores. In this class will fall to be included such compounds as the oxides, carbonates, chlorides, sulphides, and sulphates of the baser metals.

We may assume that the compounds of the baser metals which are to be found in the gold and silver ores are chiefly those of iron, zinc, copper and lead. These are the only ones which may be considered as practically affecting the question of "selective action" in the treatment of ores.

Dealing with these in their order, experiment has shown that the action of cyanide of potassium solution on freshly precipitated oxides of irou, zinc, copper and lead is much greater than it is upon gold. As an illustration of this, equal quantities of freshly prepared oxides, precipitated from the sulphates, were treated with cyanide of potassium solution, of varying degrees of concentration, for 24 hours, in the preseuce of very finely divided metallic gold. The strength of solutions employed was:

	I.	*II.*	*III.*
Cyanide of potassium in 1000 parts of solution..	5	20	50
EQUAL TO			
Cyanogen in 1000 parts of solution	2	8	20
Proportion of gold dissolved (No. 1 taken as 100)	100	237	550
Proportion of base metal oxides dissolved	100	100	100

It will be observed that the proportion of base metal oxide remained constant for each of the three strengths of solution, the explanation of this fact being that the whole of the oxides were dissolved in each case, while the proportion of gold dissolved by the solutions increased with the strength of the solntion, the whole of the gold, however, not being dissolved even in the case of the strongest solutiou.

The relative proportions of base metal oxide to gold dissolved in this experiment were:

	I.	*II.*	*III.*
Gold dissolved (taken as 100)	100	100	100
Base metal oxides dissolved	1,920	650	281

It is evident that in this case the base metal oxides (freshly prepared) were much more soluble than the gold in the dilute solution, and that such "selective action" as existed was in direct variance with that claimed for the dilute solutions iu the MacArthur-Forrest patent.

It may be argued that an experiment with freshly prepared base metal oxides does not fairly represent the condition in which the ores are usually found in nature. This is so far true, but in the carrying out of the process in practice, in many cases the treatment of the ores with alkaline solutions has the effect of producing hydrated oxides which are readily dissolved by cyanide of potassium, as in the above experiment.

It is true that in the case of some of the native oxides the rate of solution hy cyanide of potassium is very much slower; for instance, in the case of a very rich gold ore containing over 21 ounces of gold to the ton, and iron, in the state of oxides, =1.202 per cent.

It was found that by treating the powdered ore with a solution containing 1.22 per cent of cyanide of potassium (equal to 0.49 per cent of cyanogen) for 24 hours, the quantity of the solntion being equal to half the weight of the ore, the amounts dissolved were:

	Ozs.	*Dwts.*	*Grs.*
Gold	7	0	22
Iron, calculated as ferrous oxide	7	1	12

Showing practically the same amount of gold and ferrous oxide dissolved in 24 hours.

There is little doubt that had the relative amounts of gold and ferrous oxides dissolved been determined after the treatment of the solution had continued for (say) 6, 12 and 18 hours, it would have been found that the proportion of ferrous oxide to gold was greater for the shorter period.

In the case of carbonates of iron, copper, zinc and lead, the amount of such carbouates dissolved by a dilute as well as by a strong solution of cyanide of potassium is very much greater than that of the gold or silver present with them, all the more so if oxygen be absent, and the "secretive" or "discriminating" action is entirely the reverse of that mentioned in the patent.

As regards the chlorides, the presence of any appreciable quantity of base metal chlorides in gold ores is so rare that it may be neglected, but should chloride of silver be present, it is dissolved much more readily than the metallic gold.

The base metal compounds most commonly met with in gold ores are the sulphides of iron, copper, lead and zinc, in the form of iron and copper pyrites, galena and zinc blende. In the case of these sulphides, very considerable differences are met with in regard to the rate at which they are dissolved, their physical condition as well as their chemical composition affecting the action of the solution of cyanide of potassium upon them. Whatever the strength of the solution, its action is complicated by the presence of alkali as caustic or carhonate of potash, either present originally in the solution, or produced in it by the reactions taking place in the process. This alkali acts on the sulphide in certain cases, complicating the reactious, but experiment shows that as a general rule the amount of base metal dissolved is much greater than the gold or silver dissolved, even where oxygen is present. Thus, in the case of clean unoxidized iron pyrites contaiuing gold equal to 11 dwts. 10 grains per ton, the finely powdered ore was treated with half its weight of a solution containing 1.22 per cent cyanide of potassium (equal to 0.49 per cent cyanogen) for a period of 24 hours. The relative amounts of gold and based metal sulphide dissolved were:

	Ozs.	*Dwts.*	*Grs.*
Gold	0	8	14
Iron as FeS_2	41	13	0

The percentage extraction of the gold being equal to 75.6 per cent, while 78.7 per cent of the cyanogen had been used up.

In the case of oxidized ores we have to deal with base metal compounds in the form of sulphates, nearly all of which are soluhle in water. So far as regards these soluble sulphates, it requires no experiment to prove that there can be no "selective action" in favor of gold when a dilute solution is used in a case where even water will dissolve the base metal sulphates without dissolving the gold.

The presence of alkali in the solution also sheets the result, as the soluhle sulphates are decomposed with the formation of carbonates or oxides of the baser metals, which are acted upon hy the cyanide solutions as described above.

So far we have been dealing with the question of solvent or chemical action only, but it is impossible to discuss the matter from this poiut of view alone, and it is necessary to consider the question of the "selective action" of dilute solutions upon ores as involving the effect of electric action also. For instance, a mixture of particles of metals cannot be treated by cyanide of potassium solution without bringing into play the action of the galvanic couples thus formed, nor, iudeed, can a mixture (say) of sand containing particles of zinc and gold (although these be not in galvanic contact) be treated with cyanide of potassium solntion without the formation of ganvanic couples and the consequent complication of the action, for as the gold enters into solution and is diffused throughout it, it comes in contact with the zinc, which precipitates it, and thus forms the galvanic couple.

So far as the solvent action of cyanide of potassium solutions, assisted by the electric current, is concerned, it has heen known for many years that dissimilar metals, when coupled together and immersed in solution of cyanide of potassium, give an electric current.

The experiments of Gore and Skey carried our knowledge somewhat further, and gave the electromotive order of the metals in solntion of cyanide of potassium. The following is the order given by these experimenters:

GORE. 0.625 KCy. = 0.25 Cy. Temp. 50° F.	GORE. 0.625 KCy. = 0.25 Cy. Temp. 100° F.	GORE. 285 KCy. = 11.4 Cy. Temp. 50° F.	GORE. 285 KCy. = 11.4 Cy. Temp. 100° F.	SKEY. KCy. = Cy. Temp. 50° F.
+Zn	+Zn	+Zu	+Zn	+Zn
Cn	Cu	Cu	Cu	Cu
Sn	Sn	Au	Sn	Su
Ag	Au	Ag	Au	Ag
Au	Ag	Sn	Ag	Au
Hg	Pb	Hg	Hg	Ph
Ph	Hg	Ph	Ph	Hg
—Fe	—Fe	—Fe	—Fe	—Fe

It will be observed that there are certain irregnlarities in the order in which the metals are placed in the above table, and the author has made three several sets of experiments, with the view of ascertaining the cause. He has found that in the case of silver and gold the action is very slight, and it is difficult to decide as to which should be classed as the most positive metal, but as silver is found to separate gold slowly from such solutions, it should be classed as positive to gold. With tin also the action is very slight, but it is abundantly clear that in all cases certain of the haser metals are positive to gold and silver, and certain others are negative to gold and silver.

If galvauic couples of these metals be formed and placed in solution of cyanide of potassium the negative metal will be protected from attack, while the positive metal will he dissolved; and the precipitation of gold and silver from such solutions by aluminum, zinc and copper is a good illustration of another form of this ganvanic action.

The application of the action of the electromotive force, shown in these tables, to practical metallurgy made by Skey was to indicate that, where cyanide of potassium solution was used in gold milling with the idea of brightening the mercury and aiding

* A paper read before the London Institution of Mining and Metallurgy, Nov. 20th, '95.

amalgamation it dissolved any salts of mercury, the formation of which had caused the flouring. The mercuric cyanide thus formed, when brought in contact with metallic gold, dissolved it rapidly, while the mereury was reduced.

Skey further points out that most, if not all, of the sulphides occurring in nature are negative to the series of metals giveu in the above tables, and in confirmation of this the author's experiments have shown that a very considerable current can be obtained from a series of galvanic elements eomposed of gold, with galena or pyrites. Not only so, but peroxide of manganese and magnetic iron ore give a very distinct galvauic eurrent in eyanide of potassium solution when coupled with gold.

Kobell ("Anzeigen der Munehener Academie, J. Pr. Chem. L. 76") suggested employing the relative eonductivity of minerals for the galvanic current as a mineralogical character, and he classed amongst the good conductors "the native metals (tellurium excepted), fahl-ore, mispiekel, galena, pyrrhotite, copper pyrites, magnetite, graphite, and many others." Where these minerals are associated with gold or silver in solution of cyanide of potassium, so that the particles are in galvanie eontaet, the eleetric current set up will have the effect of protecting the negative element at the expense of the positive element, which, in this case, will be the gold or silver.

Such an action is entirely comparable to that which is taken advantage of for the protection of copper sheathing ou ships by the use of the copper-zinc eouple, where the zinc is dissolved while it protects the copper from going into solution. Another example of a similar applieation is the use of sheets or pieees of zinc in steam boilers, to reduce or prevent the eorrosion of the iron.

If we now consider how this galvanic couple action affects the question of the so-called "selective action," there can be but little doubt that the solution of gold is cousiderably aceelerated by such an action. In the first instance it may be well to place beyond doubt the fact that au electrical current does very materially facilitate the solution of gold by cyanide of potassium.

An experiment was made as follows: A dilute solutiou containing 1 per cent eommercial KCy was placed in a glass beaker, 6 inches diameter, to a depth of 6 inches. Two iron rods, 1 inch diameter, were immersed to a depth of 3 inches in the solution, and kept 3 inches apart. An electric current, with an intensity of 6 volts, giving 1 ampere of current by actual measurement, was passed through the solution. A sheet of gold leaf, held between two pieces of muslin, was immersed in the solution between the poles. It immediately began to dissolve visibly, and within 1½ minutes had practically all disappeared.

An exactly similar experiment in every way was made without the electric current, the sheet of gold leaf, however, in this case taking over 10 minutes to dissolve.

Another experiment was made as follows: The solution was of the same strength as before, the poles were iron plates, the surface immersed measuring 3 inches by 1 inch on each pole. These were placed 4½ inches apart, and a leaf of gold was floated on the surface of the solution between them; a current of three-tenths of 1 ampere was then passed, and in 4 minutes the gold was almost entirely dissolved, a few small fragments remaiuing, probably having been slightly greasy.

An entirely similar experiment was made with a leaf of silver, which dissolved very rapidly and completely, and another experiment was made with fine gold dust sprinkled upon the surface of the solution, where it floated and gradually dissolved.

It will be observed that in none of these experiments was there any actual contact between the gold and the anode or cathode through which the electric current was passing, but the electric action was an indirect one. The effect of the electric current, where the gold forms the anode or cathode, is, of course, well known from the ordinary practice of electro-platers.

That a very considerable galvanic action is produced by galvanic couples of the natural sulphides of the baser metals and gold or silver is shown by small battery cells, in which galena and silver, iron pyrites and silver, zinc blende and silver, are arranged as galvanic couples, the current produced being sufficient, with a battery of one or two cells, to speak for itself through an electric bell, and also to drive an electric motor.

It may also be noticed that such galvanic couples may readily be formed in the case of gold ores by the gold coming in contact with small particles of metallic iron worn off the shoes and dies of the stamps, the wear of which often amounts to from 2 to 3 pounds of iron and steel per ton of ore, a quantity enormously greater than the amount of gold usually present in an ore, such as is treated by the cyanide process.

The results of a large number of experiments of the action of cyanide solutions of varying strengths upon actual ores might here be given, but the author has found that the results obtained with different ores vary so much that it is necessary to consider each ore by itself.

There is, however, no doubt that if the action of the eyanide solution be arrested immediately the gold has been dissolved, the dilute solution will be found to have dissolved—in the ease of most ores containing sulphides—less of the baser metal compound than will have been dissolved by the stronger solution. But this naturally follows, there beiug even in the most dilute solution employed an enormous excess of eyanide of potassium over the amount required for the solution of the gold, the excess cyanide, of course, exerting its solvent action upon the base-metal eompounds. For example, the most dilute solution indieated in the MacArthur-Forrest patent is to coutain 2 parts of eyanogeu to 1000 of water. If such a solutiou be used to treat an ore, sueh as Transvaal tailings eontaining 15 dwts. of gold per ton, there will be present about 160 times more cyanogen than is chemically required for the gold dissolved. Further, the amount of oxygen present in dilute solutious in the form of dissolviug air or oxygen is known to be greater in dilute than in strong solutions; and from this cause, as well as the greater mobility of the weak solutions, it would fairly be anticipated that the aetion of such more oxygenated dilute solutions would be greater upon gold or silver than that of the stronger solutions. The recent work of Maelaurin has plaeed this beyond doubt.

One illustration may be given. A gold ore, containing a small pereentage of iron pyrites, was treated with a solution eontaining 1.22 per cent of cyanide of potassium (equal to 0.49 per eent eyanogen) for a period of 48 hours. The solution was tested for the amount of gold and iron dissolved, and the figures—calculated to 100 parts of gold in solution—were:

Gold	100 parts
Iron	1450 parts

It seems, therefore, it could easily be foreseen that a solution containing no great excess of cyanide of potassium over that needed to dissolve the gold would dissolve more of it from the ore in proportion to the baser metals than a solution eontaining a large excess of cyanide of potassium which would act more upon the baser metals, and that the galvanic couples, formed of the sulphides, etc., assoeiated with the gold in the ore, would materially aid in the solution of the gold.

Further, as to the "concentrating" action. Starting with the faet that cyanide of potassium in dilute solutions was known to be a good solvent for gold, but not for base-metal sulphides, can it be a surprise to find that on treating an ore with such solution we obtain a larger proportion of the gold dissolved to that of the base-metal compounds compared with the amounts originally present?

Surely it is a mistake to call this a "selective action" in favor of the gold. The answer to the statement, as given in the judgment of the Court of Appeal, with which we started, that "a strong solution attacks the baser metals without attacking the gold, whereas a weak solution is feeble and nil on the baser metals, but attacks the gold," is entirely contradicted by the results of both experimental and practical working of the process, which show in almost every case that the action of solutious of cyauide of potassium, whether strong or weak, is to dissolve a much larger actual weight of base metal compounds than of gold, while the electro-chemical action set up by the formation of galvanic couples plays a most important part in the reactions that take place, the effect of which has not hitherto been sufficiently recognized.

Notes on Gold Milling in California.

NUMBER V.

By E. B. PRESTON, M. E., Field Assistant State Mining Bureau.*

MILL PRACTICES.

Where the conditions permit, it is becoming the custom to place the grizzly and the rock-breaker in close proximity to the hoist, so that the bucket or car on arriving at the surface is dumped direct on a grizzly, and the crushed ore is then run over the ore-bin in the mill, and empied therein; where this is impracticable, the grizzly and rock-breaker are placed over the ore-bin in the mill.

The usual practice is to let the coarse ore from the grizzly drop on a platform on a level with the mouth of the rock-crusher, into which it is shoveled by hand; by this method the machine is not brought up to its full capacity. A better plan is to convey the coarse ore from the grizzly into the bin by means of a chute, having a sliding gate immediately above the receiving point of the crusher, and which is set so as to keep the space between the jaws always filled. In this way the work becomes automatic, and the services of the man attending the rock-breakers can be utilized in other parts of the mill during part of the time. Under such an arrangemeut the crusher will require more power, which should be independent from the other machinery. The rock-breaker is usually run during the daytime only, as it can crush in that time enough ore for the mill for the twenty-four hours.

The self-feeders, in a similar manner, are kept automatically filled from the main ore-bin. The feeding through the tappet striking on the bumper-rod of the self-feeder, has of late been modified. A collar is fastened below the guides on the feed-stamp stem, taking the place of the tappet, thus avoiding the long bumper-rod. The gauging of the feed must be earefully attended to, if the stamps are to work up to their full capacity there should never be more than 1 inch of rock between the stamp and die when they come together, or the feed should be just sufficient to keep iron from striking iron. When cleaning up the batteries, the self-feeders are drawn back on a track toward the ore-bin, giviug access to the back of the mortars.

In preparing the mortar for ore-crushing, an inch or two of tailings is spread evenly over the bottom before putting the dies in plaee, as this saves the wear on the bottom plate. After the dies are placed exactly under each stamp, crushed ore and fine rock are banked around them to retain them in proper place until the sands have settled firmly about them. Care must be observed to keep the tops of *all* the dies at the same level at all times, as otherwise, when the stamps are dropping the highest die will strike against iron, while the others are still supplied with sufficient ore; this is known as "pounding."

The stamp-head, or boss, is now plaeed on the die with the small conical opening at the top, and the stem lowered into it, iron against iron if it is a close fit, and driven in solid. In ease the conneetion is not tight, canvas strips about 2 inches wide are laid crosswise over the opening before the stem is lowered. The stem, with the stamp-head, is now raised until the lateh-finger eatches under the lower faee of the tappet and holds them suspended, and the shoe placed on the die. If the stamp-head hangs too low to permit of this, the stem is raised, and a block placed on top of the finger for the tappet to rest on. Narrow wooden wedges, about 1 ineh wide, the length of the neek of the shoe, and of the requisite thiekness to fit tightly into the conieal opening at the bottom of the stamp-head, are arranged in place and tied with a string. The block and finger are then removed, the stamp-head dropped over the shank, and wedges driven down firmly. This is done best by revolving the eam-shaft slowly, and, while placing the cam-stick between, permitting the eam to act on the tappet, raising and dropping the stamp until the lower edge of the stamp-head is nearly in contact with the shoulder of the stamp. It is not advisable to permit them to come solidly together, as it tends to loosen the iron ring that reinforces the stamp-head. A quick aud eonvenient method of placing the wooden wedges ou the shoe, is to cut a piece of canvas to fit exactly around the neck, and attach the wedges to the canvas by driving a tack through each one into the cloth. By keeping a supply of these on hand, it bccomes an easy matter to encircle the shank on the shoe and tie them fast, should the shoe become loose and drop off while the mill is running.

The Drop.—The uext operation is fixing the distance through which the stamp is to drop before striking the die. In most mills this distance is uniform for all the stamps; but, as previously stated, occasionally the stamp operating the feed, as also the two outside stamps, receive a greater drop.

The right height to give depends on the nature of the ore, as also on the speed to be given to the stamps; that is, the number of drops per minute. The tendency in most California mills is to run at a high rate of speed, usually in the neighborhood of one hundred drops per minute. The height varies from 4 inches to about 10 inches, generally but little, if any, above the water-level in the mortar.

In arranging the stamps for an equal drop, wooden blocks, cut about ½ inch longer thau the drop the stamps are to receive to permit the cams to clear the tappets, are placed on the die, between it aud the shoe. Pieces of 2x4 scantling, cut to the desired length, answer well for the purpose. The keys in the tappet are loosened with a drift made of steel, the size of the keyholes, and used only for that purpose, and the stem is allowed to slip through the tappet until the shoe rests on the top of the wooden block beneath; or, if the shoe was resting on the block previously, the tappet is slipped up till resting on the latch-finger, when the keys are driven home solid. Care must be exereised not to drive the keys too solid, else there is danger of splitting the tappet. For the convenicnce of the millman a chalk mark is made around the stem just above the tappet, which enables him, while running, to at onee deteet if any of the tappets have slipped. Should this occur it must be immediately re-set, or the battery work will be irregular. The battery-plates and choek blocks are next put in place and keyed.

(To be Continued.)

* Bulletin No. 6, California State Mining Bureau.

FRENCH JOURNALS report the aluminum torpedo boat, recently built by an English firm for the French Navy, is a failure. The metal has corroded to such an extent during the time the vessel has been in the dockyard basin that it can be penetrated with slight pressure. The boat is said to be unfit for service, and the French Navy Department has renounced the idea of building any others, and has ordered the torpedo cruiser Foudre to be supplied with steel boats instead of aluminum boats, as originally intended.

Mining Summary.

CALIFORNIA.

Amador.

A SAMPLE OF RENEWED LIFE.—About six miles above Sutter Creek there has been in steady operation for the past nine months a small mine and six-stamp mill connected therewith, owned by J. Treadwell. It was operated seven or eight years ago by S. D. R. Stewart, who erected the mill. After giving the property what he considered a fair test he abandoned it as unprofitable. It was reopened last February by the present owner. After working several months with indifferent success, a new ore body was encountered, which has proved of a paying grade, and the mine has been worked at a profit ever since. The claim is six miles east of the mother lode. It gives employment to from fifteen to twenty men.

GENERAL MINING NOTES.—*Ledger:* A Grass Valley man is building a plant for saving sulphurets from the Zeile mill. It is estimated that $40,000 in sulphurets goes down the creek annually from this mill. This is no reflection upon the millmen, as the percentage of loss in the Zeile will bear favorable comparison with any mill in the county. Several attempts have been tried to work the tailings after leaving the mill, but all with indifferent success. The great obstacle has been the difficulty of securing fall to carry off the waste. The Grass Valley proposition is to elevate the tailings before extraction.

The Volcano Gold Gravel Company is building a flume 1000 feet long to work the Peck claim in the Volcano basin.

Calaveras.

THE NIGHTHAWK MINE. — *Citizen:* Burns and Pfortner got to the bottom of the gravel, which is of a cement nature, and can be best worked by mill or arrastra. They are now arranging for machinery.

El Dorado.

AROUND PLACERVILLE.—(Special correspondence.)—C. J. Heald is operating a five-stamp mill on his plant near Nashville, twelve miles south of here, and is taking out ore that averages $15 per ton. This is known as the Montezuma mine.

E. W. Chapman is erecting a twenty-stamp mill on the Zandgraft mine, twenty-five miles northwest of Placerville. A large body of ore is encountered on the 400 foot level. The hoisting works are in operation, and it is expected that the mill will be ready for work within sixty days.

Lyons, Gifford & Tong are running a five-stamp mill near Clarksville, twenty miles south, developing four claims. Their ore averages $8 per ton.

The Big Channel Bend Company are erecting a five-stamp mill near Volcanoville. E. W. Chapman has an interest in this plant and is also superintendent. This is the property of a San Francisco company.

Work has been resumed on the old Doncaster mine, near Kelsey. This is owned by Germyn Brothers, of Scranton, Pennsylvania. The shaft has reached a depth of 100 feet.

Sam Lane is operating a five-stamp mill in the old Stillwagon mine and taking out $30 rock, twenty-seven miles southeast of here.

The Gray mine, thirteen miles west, has been bonded to J. Graham of Chicago. Two shifts are at work and the shaft is being continued from the 150-foot level. In 1872 this property produced $110,000.

M. & C. Farozza are running a tunnel on the Old Try Again, two miles north of town. They have attained a length of 1400 feet and expect to tap the channel at another 100 feet.

J. I. Reid has bonded 800 feet to J. E. Spencer. This is located within the town site, and is on the mother vein. It has two tunnels, and a shaft 100 feet deep. The ore taken from the shaft and tunnels will average $50 to the ton.

Inyo.

THE CASEY MINE. — *Register:* The new hoisting plant at the Casey mine is now in operation. The mine has been prospected to a depth of 450 feet, and Supt. Duenweg expects to sink as far as the cable will permit, or 800 feet in all. He has an offer for working the tailings by the cyanide process.

Lake.

QUICKSILVER AT SULPHUR BANKS.—The output of quicksilver has been 500 flasks per month for the last three months. The shaft is 200 feet deep, fifty men are employed.

Nevada.

PROPOSED CONSOLIDATION. — Gen. A. M. Dobbie of North Bloomfield tells the *Tidings* that he is interested in a plan of consolidating all of the gravel claims along the ridge, from the Derbec northward for six miles, into one extensive corporation: stock to be issued to the claim owners, proportioned to the number of acres held by them, and then drive a tunnel from the Derbec northward, all the time working in the pay gravel that is known to exist. The expense would be borne by the syndicate of claims composing the company, to whom the profits would also be distributed. The Derbec would be a favorable point to start from, as the mine is naturally drained. The General states that he is meeting with much encouragement from the various claim owners to whom he has submitted the plan.

A RESTRAINING DAM.—A dam built to restrain the debris from the Omega gravel mine is finished at Scotchman's creek. From bedrock to the bottom of the dam is 100 feet, the distance across creek on top of dam is about the same. The lower section is built of logs A-shaped, the ends of the logs on the lower side set in a groove of bedrock. The upper section, built further up stream, the foundation imbedded in tailings, is of brush forming two slanting walls the stock ends of the brush to the outside, as the walls were raised earth and rocks were sluiced in forming an embankment tapering from 150 feet at the base to about forty feet at the top. After the dam reached the required height a canal six feet deep was cut through the solid bedrock a short distance from the north end to carry off surplus water in case of a freshet. For ordinary purposes a heavily timbered shaft beyond the up-stream wall connecting with a bedrock tunnel under the dam will be used. This shaft will reach to the surface of the reservoir formed by the structure, and will only carry the water after the debris has been precipitated.

ORGANIZED AT MAYBERT. — The Fountain Head Gold Gravel Mining Company has reorganized at Mayhert; membership fee, $30; M. A. Baugh, W. H. Frye, C. A. Lillie, C. C. Whittaker, J. W. Zeigler of that place are directors.

THE OLD BOWMAN MINE.—The *Telegraph* hears that the General Bowman mine is to be reopened by an English concern. The mine is situated near Bowman's lake and was worked thirty years ago.

THE W. Y. O. D.—The W. Y. O. D. is one of the mines that maintains a regular output. It has to its credit a total production of $550,000, of which a good portion has been disbursed in dividends, and over $100,000 spent in improvements. The total amount levied in assessments by the company for the purpose of starting the property was $22,500. The company recently purchased the General Grant, formerly known as the Telegraph mine, and the Parr claim, extensions of the W. Y. O. D., both of which are patented and on which development work is now being carried on. At the present time the mine is 1450 feet in depth and preparations are being made to continue sinking. During the past twelve months 1700 feet of upraises have been run, the shaft sunk 400 feet and drifts run 3500 feet. Fifteen levels are opened up and work is being done in ten of them—all below the 600 level. The vein courses northerly and southerly, the same as in nearly all the other mines of the district, and dips to the west. The average size of the ledge is from twelve to fifteen inches.

Placer.

MINING IN THE MIDDLE FORK.—*Herald:* On the middle fork of the American river, after connection with the north fork, a number of men are engaged in mining. The opening of the old mining claims and working over of the sands of the river bed seems to be quite extensive. Mining in that direction is having an upward tendency and is in demand.

The Mammoth Bar mine on the Middle Fork, under Messrs. Davis' supervision has shut down work for the season.

AROUND MICHIGAN BLUFF. — *Herald:* The mill on the American Bar mine is completed.

The Dixon mine at Deadwood has closed down for repairs.

The New Treasure Company are pushing their tunnel ahead.

The Grey Eagle Bar Company have completed their shaft and have one of the best equipped gravel mines in the State.

NEAR CISCO. — *Sentinel:* The Henrietta Mining Company is working a ledge of decomposed quartz on Red mountain, near Cisco, by the cyanide process.

GENERAL NOTES.—*Herald:* At the Eureka Con. drift mine the company are pushing the tunnel. This claim is the largest drift mine in the State, being composed of 3600 acres.

At the Adams mine, between Auburn and Newcastle, the shaft is down over 200 feet and the ledge is increasing in size. Drifts have been started on the 200-foot level.

At the Hathaway work is being pushed on the 400-foot level and the quartz is richer than that found in the levels above.

The bullion shipment from the Mayflower mine for November amounted to $16,000. This mine employs about 115 men at present.

Plumas.

GOOD PROGRESS. — *National-Bulletin:* The large jack-head pump recently put into the shaft on the Elizabethtown Channel mine, works satisfactorily. Drifting through soft shaly bedrock towards the channel progresses.

Riverside.

THE GOLDEN CHARIOT.—At a depth of 300 feet a four-foot ledge has been struck in the Golden Chariot mine at Perris.

THE SANTA ROSA.—The Santa Rosa is now down to a depth of 450 feet, and the drifts extend both sides of the shaft 750 feet. The ten-stamp mill which has been running has recently been doubled in capacity.

San Diego.

AT JULIAN.—A crushing of twelve and a half tons of ore from the Golden Rule mine took place last week at the Ready Relief mill. The lot was sorted into two patches. Seven tons of high grade ore went $107 per ton and five and a half tons second-class rock went $21 per ton.

Sierra.

CONTRACT LET.—T. Williams has a contract to make an upraise of 325 feet in the face of the tunnel at the Pine Tree mine, near Sierra City.

Siskiyou.

BOUGHT SEVEN CLAIMS.—The Fidelity Investment and Development Company of this city has bought seven claims, under the name of King Solomon's Mines, on Matthews creek, two miles from the south fork of Salmon river.

THE UNCLE SAM. —*Union:* The Uncle Sam mine, on Forks of Salmon river, which was recently bonded to a San Francisco company for $60,000 is to be started up and will be operated by J. F. Boyle.

NEVADA.

WIRE CABLE.—Peck Bros. have let a contract for a mile and a quarter of wire cable tramway to be put up between the Morgan mill and the Mexican for transportation of tailings.

STOREY COUNTY.

LATE MINE REPORTS.—CHOLLAR—There is no especial change to report of the workings above No. 2 crosscut and the south drift from it on the 450 level. We continue to follow the pay which lies in streaks and bunches. Repairs in main shaft and on the 500 level are under way. We have saved and shipped to the Nevada mill for reduction 57 tons and 1600 pounds of ore, which has been allowed to accumulate for a run.

ALPHA.—During the past week the raise in the southwest drift from the west crosscut was advanced 10 feet; total height, 17 feet; passing through a mixture of porphyry and quartz of low grade. Face is now in quartz assaying $5 per ton. The southwest drift from the west crosscut, 450 level, has been extended during the week 7 feet; total length, 30 feet; face in quartz giving assays of from $5 to $10 per ton.

POTOSI.—In the stopes above the north drift from the east crosscut, 550 level, we have opened the fourteenth floor, and find that, though the quartz continues, the value per ton has decreased so much as to preclude its extraction. We are stoping on the twelfth and thirteenth floors, where we are now getting a little pay ore of fair grade. On the eighth and ninth floors we are saving some old fillings that are about of sufficient value to warrant extraction. On the sixth floor we are running a west crosscut which is now out 20 feet in low-grade quartz. The raise from the 550 level track floor, south drift, is up two floors in old ground, the fillings in which assay in places. We have shipped during the week two bars of crude bullion, showing a par value of $10,189.67.

ESMERALDA COUNTY.

OPHIR AND PAYGRIT.—The Ophir and Paygrit mines, in Central district, are sold to C. H. Wilbur of Salt Lake City; price, $2500. The new owner has also bought a five-stamp mill, which is near White Plains, and will remove it to Central.

NYE COUNTY.

Theo. Cirac & Sons' gold mill at Union Canyon, near Grantsville, started up on the 28th ult.

LANDER COUNTY.

A BIG INCREASE.—The *Silver State* says that "the Austin Mining Company of Austin has increased the working force by 100 employes."

OREGON.

SALE CONFIRMED. — Judge Fullerton, at Roseburg has confirmed the sale of the Annie mine in Bohemia district, made by Receiver Younger to G. E. Milligan of Chicago. The mill and mine are in operation under the management of P. J. Jennings. A force of men has been put on to drive a lower tunnel in 340 feet. A winze sunk on the ledge at the depth of fifty feet showed black sulphites. The intention is to expend a large amount of money developing the mine, and plans for a new twenty-stamp mill will be made in January.

THE OCHOCO MINES.—E. N. Kluge, representing a mining company of New York City, has bought and bonded all the placer ground in the Ochoco mines, five miles in length by 300 feet wide, together with the water rights, flumes and ditches. It is the intention to construct reservoirs for storing water in the vicinity of the ground they have bought, so that next season they can operate the mine to advantage. They will put in a sawmill at an early date to saw out lumber for a bedrock flume, which will be some three miles in length and will open up the mine on scientific principles. The ground which this company now has control of has been worked more or less since the spring of 1871, but no one has ever had hold of the property who had enough capital to work the ground as it should have been, hence the results have been varied.

The Princeville *Review* says Mr. Kluge paid over $5000 for a half interest in the Ochoco mines, and has an option until next June on the claims held by the Belkuap-Perry-Fuller Company, and that Mr. Kluge says he will return next spring and put in a $5000 plant.

BRITISH COLUMBIA.

BETTER MANAGEMENT. — Under the new management at the Number One mine at Ainsworth, with a force of one-fourth that were formerly employed, they are taking out double the amount of ore. They now have 100 sacks ahead of the teams. The *Tribune* says: "The bulk of the ore runs from 80 to 100 ounces and some of it from 1000 to 3000 ounces. The concentrator is closed down for the winter."

THE WORK WELL IN HAND.—The Hall mines smelter at Nelson is completed, the tramway is delivering ore, and is expected to be in operation Jan. 1st, '96.

AT ROSSLAND.—The contract for the tramway from Rossland to Trail has been let and the work begun. The route will cover twelve miles.

UTAH.

MERCUR DISTRICT. — (Special correspondence)—Since Captain J. R. De Lamar of New York arranged in September last for the purchase of the control of the stock of the Mercur Gold Mining and Milling Company, whose mines are located in Camp Floyd district, in Tooele county, Utah, the argument has been freely urged, until the last few weeks, that the purchase price was excessive and wholly unwarranted. The Mercur property was originally capitalized for $5,000,000, divided into 200,000 shares of the par value of $25 each. Up to and including October 21st, 1895, the company had paid dividends amounting to $1.75 per share, or a total of $350,000, and when the payment of dividends had been commenced the company had paid for all its property and had discharged all its debts. This property consists of 136 acres of surface locations, embraced in the original ten claims of the company, and about thirty-two acres additional that were purchased just before the deal was made for the sale to Captain De Lamar. Added to the actual mineral properties is a mill with a total daily milling capacity of 200 tons, numerous mine buildings and offices, and an independent water right, derived from a spring situated on the ground of the company, a consideration of no little value itself in a country in which water is so scarce that one company has just completed the construction of an expensive pumping plant and a pipe line fourteen miles in length, at a cost approximating $75,000. The flow from this spring has been enough to supply the mine and mill and to furnish all the water required at the Mercur end of the line by the Salt Lake and Mercur railroad.

The ore bodies in the mine run from four to thirty-six feet in thickness, carrying ore of a value that has never averaged less than $11 per ton. The mill treats 200 tons of this ore per day and saves 90 per cent of the values, or say $1980 per day. The cost of mining and milling the ore is, according to the owners, $3 or less per ton, but accepting $3 as the cost and $11 as the maximum value per ton of the ore, the present milling capacity of the property provides for net earnings of $1380 per day, or in round numbers, $500,000 per year. The ore necessary to this result is to be taken from a vein with a maximum dip of 19 degrees to the northeast, the Mercur Company's ownership on the vein being represented by 168 acres of surface locations. Over this entire area prospecting has been conducted from the start, with the result that the ore carrying the values has been found at all points at which prospecting has been prosecuted, while in the main workings of the Mercur mine ore bodies sufficient to supply the present mill for a period of five years have been blocked out.

The price which Captain De Lamar will pay for this property is $7.50 per share of the capital stock, which places a total valuation on the property of $1,500,000. This the croakers say is too much, but inasmuch as they took no part in the development of the district which has now become famous, their opinions as to the value of any proposition therein are not entitled to much weight. Moreover, if any one should find on his 160 acres of land a vein of gold-bearing ore averaging twenty feet in thickness and $11 in gold per ton, underlying the entire farm, he would probably be overwhelmed with offers in the neighborhood of $1,500,000 for his entire interest. And yet this is exactly what the Mercur people have done, excepting that they have proveu the existence of the ore body under the entire area and have demonstrated the utility of the process of leaching the gold by the use of cyanide.

SILVER REEF.—The Barbee & Walker mill at Silver Reef is testing a new process that is expected to "revolutionize the methods of handling ore in that locality." There is plenty of ore there.

A FINE PLANT.—At Green river, six miles below the station of Green River, on the Rio Grande Western Railway, have arrived twelve carloads of machinery, including a Bennett placer machine which cost $40,000. It scoops up 2,000 cubic yards of gravel in ten hours, pumps up the water with which to wash it, screens the dirt and sends the gold and black sands into an amalgamator. It is illustrated and described on page 392.

There is much gold in the bars along Green river, but it is extremely fine. If this undertaking is successful it means a good fortune to the promoters.

The Northern Light mine, on Lion hill, Ophir district, has been sold for $58,000 to Messrs. Dern and Airis, formerly owners of the Mercur. The Northern Light was a famous producer of high grade silver ores in early days.

The wet ore famine of the Salt Lake smelters has revived interest in the La Plata district, north of Ogden. Some of these ores run as high as sixty per cent lead, but very low in other metals.

A reduction plant is to be established at Park City for the treatment of the zinc ores found in that district.

IDAHO.

IN THE CŒUR D'ALENES.—The Morning mill started up this week.

At the Bunker Hill mine they are blasting out a station for another shaft on the Reed tunnel level.

Work on the big tunnel at the Standard is being pushed. The tunnel will be 3300 feet long, and will tap the mine at an enormous depth. It is now in about 800 feet, and the work is progressing at the rate of about 200 feet a month. When completed electric cars will be put in to haul the ore out; also a passenger car will be added to carry the miners to and from work.

More than 150 men are now at work on the Frisco.

The Gem is working three eight-hour shifts on the shaft.

The Last Chance is producing considerable ore.

AT GIBBONSVILLE.—The Idaho Gold Reduction Co. suspended payment last August, throwing out of employment over 100 men, and stopping work on the new stamp mills, roasters and general development work. The property was placed in the hands of a receiver, who will dispose of the personal property to settle some of the indebtedness.

The Hughes Creek Placer Company also failed last summer. A syndicate has now taken a bond on the property and will go ahead with the work.

The American Development and Mining Company have thirty stamps crushing 125 tons of sulphuret ore every twenty-four hours. They concentrate it to about one-tenth, saving what they can on the plates. To reduce the concentrates they have just started a twenty-ton per day roasting and chlorination plant. It is the intention to put in thirty more stamps next spring.

A NEW CYANIDE PLANT. — At Dixie, D.

Rieber will add a cyanide plant to his new mill. The ore goes $22.50 a ton.

MONTANA.

GENERAL MINING NOTES.—J. Valley is reported negotiating the sale of his Granite Bello mine to C. Clark at a figure approximating $15,000.

The mineral output for Butte since 1880 has reached a total of $226,000,000. The total for the present year is estimated at $31,000,000.

It is expected that the report of the Boston & Montana Mining Company for this calendar year will show a surplus of $750,000 after paying $7 per share in dividends, and ground opened for eight years ahead.

A GOOD SHOWING.—From Helena, comes the statement that there are now more men at work in the mines of Montana than before the slump in silver. In Butte the copper mines have increased force and output until they are employing 800 more men than at any previous time in the history of the camp. Mining men have also turned their attention to the gold leads, and active prospecting is going on everywhere. About fifteen miles from Helena city a porphyry dyke, which was known to carry gold, has been prospected thoroughly, and several mills are now operating successfully. This dyke is twelve miles long and 600 feet wide. It will average $4 to $5 per ton. Claims are being staked and sell rapidly.

A MINING DEAL.—C. Child of New York has bought the Prize mine in Granite district. The purchase price is not stated, but the first installment, $150,000, is reported paid in cash. The mine was discovered five years ago by the Murray brothers and in that time they have taken out $85,000. It has a ten-stamp mill. The shaft is down 300 feet and there are about 700 feet of levels. The expert who examined the mine just before the deal was closed said there was $1,000,000 worth of ore in sight. The new owner will erect a steam hoist and provide additional mill capacity.

MISSOURI.

LEAD AND ZINC.—A new town called Duenweg has been laid out, twelve miles from Carthage, Mo., on the site of the rich strikes of lead and zinc which were make last summer. All the land in the vicinity has been leased, hundreds of prospect shafts are being sunk, houses are in course of moving from neighboring towns, and new ones are going up in all directions. The railroads near at hand, the Missouri Pacific and the Gulf, have connected the new town by junction lines with the rest of the world.

MICHIGAN.

TWO DIVIDENDS.—The Kearsage Copper Mining Company declares a $1-per-share dividend, payable on the 30th, the first in six years. The Osceola Consolidated Copper Mining Company has declared a dividend of $1.50 per share, January 15th, the first dividend of the year and the fortieth in the history of that property, making a total of $2,022,500.

COLORADO.

THE LEADVILLE OUTPUT.—Leadville mining men state that over 1,300 tons a day are now being mined. The output for '95 will be over 200,000 tons, and the value of this ore will be in the neighborhood of $10,000,000.

THE RICO MINES.—The Rico-Aspen Mining Company have closed two of their properties and will not resume work on them till spring. No reason is given. Since the closing of the smelter both the Syndicate and Stephenite were not producing a grade of ore that would pay to ship to smelters elsewhere. The immense fall of snow no doubt hastened the closing of these properties, as it was with great difficulty they succeeded in packing what ore they had broken to the railroad transportation. Other properties of the Rico-Aspen Company are still being worked with a larger force of men than heretofore, and they are producing large quantities that net a profit.

ON THE ANIMAS RIVER.—At Baker's Bridge on the Animas river, twenty miles above Durango, the river rushes through a box canyon 600 feet long and from forty to fifty feet wide. At the lower end of the canyon a shelving rock across the mouth forms a pocket of the entire canyon into which it is presumed that the gold which is found above the canyon has been settling for ages. A company organized by Denver parties has secured the surrounding placer ground, erected a dam across the head of the canyon and turned the course of the river. The company recently pumped the water out of the canyon, preparatory to sinking a shaft in the cement which has formed in the bottom of the canyon. Leaks in the dam delayed operations but the leaks have now been stopped, and as soon as the silt which has been deposited since the commencement of operations is disposed of the company proposes to sink a shaft to bedrock and crush and wash the cement in which it expected to find the gold.

NEW MEXICO.

SUMMARY OF MINERS' EXPERIENCE AT LA BELLE.—A number of placers have been located and a few worked with some success. The value of the gravel varies from thirty cents to $3 per cubic yard; thickness of gravel varies from two feet to ten feet, as so far developed. A small amount of sluicing has been done and some work with a giant. The comparatively limited water supply prevents extensive work except during the spring months. The spring of 1896 will witness great activity in placer mining in this district.

The development work done on lodes is limited in extent, although a few of the claims have considerable work done on them. The increase in value with the depth is regular and continuous. The ore is in every case largely (sixty to seventy per cent) free milling. The tailings will concentrate about twenty or thirty to one, and will reach values permitting of shipping at a good profit.

The ores of the district at present yield sixty per cent of their values readily by stamp milling, while bumping tables for the tailings will concentrate the latter twenty or thirty to one, with a maximum loss of fifteen per cent. The Pelatan-Clarici process appears to be peculiarly adapted to the treatment of these ores. A test recently made on a sample of "Midnight" ore yielded ninety-nine per cent of its gold value and sixty-three per cent of the silver value, by this process.

ARIZONA.

MINES BONDED.—The Copper Queen Mining Company has bonded the Hughes, Aimee, Daisy, Winnie, Crest, Little Mammoth and Surprise in Mineral Hill district, near Tucson, for $70,000; $3,000 down; bond to mature May 30, '96. Meantime the mine is to be worked by the company and a royalty of $2 per ton is to be paid by the company on all ores extracted to be deducted on final payment, if the deal goes through.

INCREASED WORK.—The Mineral Hill Mining Company ships 18 ore to Bisbee. The force is increased from 35 to about 125 and the output of ore increased to forty tons per day. The ore averages twelve per cent copper. It also carries some silver and gold. The camp is seventeen miles from Tucson.

LOWER CALIFORNIA.

PYRAMID MINING CO.—The Pyramid Mining Company, W. E. Howard of San Diego, vice-president, will shortly begin operations on a large scale at Juarez, ninety-five miles south of San Diego. The company have two concessions of 8,000 acres of placer ground, besides 231 placer claims, and an expenditure of about $15,000 will be made in machinery and in preparing to engage in active work.

Personal.

H. A. RUSSELL is new selling agent of the General Electric Co.

E. BOYCE, an agitator from Wallace, Idaho, is addressing miners in Nevada and Placer counties.

L. B. STEWARD of the Everett mill goes to Deaver to take charge of a similar institution there, at an annual salary of $5000.

F. R. CULBERTSON, formerly superintendent Tiger mine, Burke, Idaho, is now general manager Consolidated Tiger-Poorman mines.

WILLIAM S. HEGER, the Pacific coast manager of the Westinghouse Electric and Manufacturing Co., has this week established his headquarters at 228 Bush, the ground floor of the Mills B'ld'g.

S. C. THOMPSON, of the firm of Maltman & Thompson, reduction works, near Grass Valley, Cal., goes to Johannesburg, S. A., to take charge of mining properties. Were the California miners in South Africa to hold a reunion in '96 it would take a big hall to hold them.

GOV. H. G. BLASDEL and wife celebrated their golden wedding at their home in Oakland on the 9th inst. The occasion was also the silver wedding anniversary of their son, Mr. S. W. Blasdel of Portland. Gov. Blasdel was elected the first Governor of the State of Nevada in 1864, and is now a San Francisco manufacturer. In his Oakland home, last Monday night, where four generations of the family were represented, from the seven-months old great-grandchild to the pioneer of seventy years, he seemed as stalwart and of as commanding presence as in the first days of the "battle-born State," over thirty-one years ago.

S. H. H. CLARK, president and managing receiver of the Union Pacific, says there is no ground for the report that a wealthy Eastern syndicate, headed by the Goulds, Sage and the Vanderbilts, is planning to secure control of the road and take it out of the hands of the receivers. The road will never be able to pay the interest on its debt and its operating expenses, and, therefore, shrewd financiers are not anxious to buy it at present. "Something," says Mr. Clark, "must be done this winter in the way of a settlement of the indebtedness of the road, or it will be entirely bankrupt. The reorganization committee is at work formulating a plan. It proposes to make a new bond issue for the total indebtedness at a rate of interest that will enable the road to meet its fixed charges. Then preferred stock is to be issued to cover the deficit caused by reducing the interest. This stock may be of value in case the road ever earns an excess over its running expenses and fixed charges."

Catalogues Received.

FRASER & CHALMERS, Fulton and Union Sts., Chicago; London, Eng., 182 pp., orange and black, 6x9 in. Gold and silver mills; catalogue No. 4, giving illustrated description, sectional and longitudinal views of rock-crushing machinery, perforated metal, automatic ore feeders, mortars, shoes, dies, cams, tappets, steam stamps, stamp-mill supplies, wet and dry crushing silver mills, roasting furnaces, ore dryers, belt elevators, power and water for stamp mills, tables, recipes, belt gearing, etc., etc., a catalogue of unusual merit; giving considerable valuable information apart from any advertising tendency. "Notes on Gold Quartz Milling at El Callao," "How Cheap Can Gold Ore Be Worked?" and other data are of special interest to miners. The plates for the illustrations are especially good, many of them having been prepared for the present work.

THE Stilwell-Bierce and Smith-Vaile Co., Dayton, Ohio, 112 Liberty St., New York, 52 pp., 6x9 in., pigeon's egg, gilt enamel; describes and illustrates filter presses, all styles and sizes, for every duty.

THE same company, 134 pp., 6x8 blue and bronze; steam pumps, pumping engines, condensers and artesian-well machinery, of every description and for every purpose, copiously illustrated.

(Catalogues and treatises mentioned in this review are sent free by their publishers on application.)

Coast Industrial Notes.

—The Salem, Or., Street Railway Company passed into the hands of a receiver on the 4th inst. The action was caused by the failure of the company to meet notes for $8,712.

—The California Machine Works (William H. Birch & Co.) have leased the premises formerly occupied by the Pacific Iron Works, and have removed to 129 First street, this city.

—The Pacific Cable Co. was incorporated in Albany, N. Y., this week, with a capital of $1,000,000, to run its own or leased wires from New York to this State, thence under the Pacific ocean to Japan, touching Hawaii and other islands on the way; thence to the continent of Asia and islands adjacent thereto, including the islands of Australasia, an extensive programme.

—To illustrate what Japan is doing in the one line of cotton manufactures, it is noted that in 1885 Japan imported $800,000 worth of raw cotton for the 50,000 splindles in nineteen mills, and in 1894 $19,500,000 for 600,000 spindles in forty-six mills. Their imports of cotton yarns from Great Britain decreased proportionately the same time. Japanese mills paid handsome dividends last year.

—Bids for building the new Union Ferry depot in this city were opened by the Harbor Commissioners last Tuesday. There were fifty-two in all. The sum of the bids, walls faced with buff brick, was $471,022; sandstone facing, $522,022. On the iron work the Risdon Iron Works was the lowest bidder, $188,000; on the carpenter work Bateman Bros. were lowest, $48,400; plumbing, E. J. Duffy, $11,123; roofing, William Crouin, $43,599; painting, G. J. Smith, $11,900. The work will shortly be awarded.

—On the Columbia river, during 1895, 617,460 cases of salmon were packed. Each case holds 48 1-lb. tins. The value was $3,342,928.65. Of these, 433,178 cases were packed on the Oregon side and 184,282 on the Washington side. On the Oregon coast streams and bays 62,620 cases were put up. About 64 per cent of the catch on the Columbia river was taken with gill nets, 12 per cent with seines, 19 per cent with traps and 5 per cent with wheels. The number of persons employed in the fisheries and allied industries in Oregon during the year was 5349, to whom was paid $1,236,246 for labor. The pack this year was larger than for any season since the origin of the industry, save two—1883 and 1884—when the pack was 629,400 and 620,000 cases respectively.

—Considerable comment has been caused by the announcement that the S. P. Co. has placed an order with English iron makers for 10,000 tons of steel rails. This is the first importation of any consequence for some time, and is a result of the advances made in the last few months in the price of rails in this country, taken together with the present reduced tariff rates. The order was placed with the American representatives of Cammell & Co. of Sheffield, England. President Gates of the Illinois Steel Co. says in regard to the incident: "Wherever railroads wish to buy rails where the freight cuts an important figure in the cost under the low tariff rate of $7.84 per gross ton, the American manufacturer is always seriously handicapped. As an illustration, the purchase of those 10,000 tons of rails: The freight on these rails, all rail, from Chicago would have been $13.44 per gross ton; added to our price of $29, free on board Chicago, would have made the price $42.44. The English manufacturers are able, on the ground of lower cost, which is solely in labor, to produce and sell their rails at the present time for $23.14 per ton; they would have no trouble, in my judgment, in obtaining a freight rate of $2 per ton from any English port to San Francisco, as, were English vessels not to take this freight at a low rate, they would have to go in ballast, and as there is a large quantity of wheat shipped from San Francisco boats are always glad to get any freight, and consider it clear profit over and above the cost of loading and unloading for any carriage they may obtain. Taking the English price of say £4 15s, which is their present price, figuring a pound sterling at $4.88, would make the cost of the rails, f. o. b. English port, $23.18; $2 freight to San Francisco, $7.84 duty, and 25 cents for commission and insurance, would make the cost of rails laid down at San Francisco $33.27 per ton, as against our price of $29, plus the freight to San Francisco, $13.44, equals $42.44. As long as the American manufacturer is paying the present scale of wages we cannot hope to compete with the English manufacturer at any port on the Gulf of Mexico or Pacific coast unless our freight rate is under $5 per gross ton. If we had attempted to meet the English competition on these rails we would have had to sell the rails at $19.79 per gross ton at our works, plus freight, $13.44, equals $33.23. I have prepared careful and correct figures to show what the loss to the laboring man and the railroads and the lake carriers is in the United States on account of this order having been placed in Europe. These figures are as follows: To the railroads—On account of 24,000 tons of ore at 60 cents from mine to lake port, $14,400; on 15,000 tons of coke at $2.75 from the ovens to Chicago, $41,250; on limestone, 5000 tons at 55 cents from the quarries to Chicago, $2750; on 8000 tons of coal at 70 cents from mines to Chicago, $5600; on freight, 10,000 tons at $13.44 from Chicago to Pacific coast, $134,400. To the lake carrier—24,000 tons of ore at $1.05 from port to Chicago, $25,200. To labor—On 24,000 tons of ore at mine at $1, $24,000; on coke and in mining the coal, 15,000 tons at 80 cents at the ovens, $12,000; on limestone, 5000 tons at 35 cents at the quarry, $1750; on 8000 tons of coal at 55 cents at the mine, $4400. To labor and manufacturing—10,000 tons at $5 per ton, $50,000. Total, $315,750. As transportation represents practically all labor, it means this amount has gone into English coffers instead of being distributed in this country."

List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING DECEMBER 3, 1895.

550,580.—SHIP—J. Bluemel, S. F.
550,864.—EYE GLASSES—A. E. Butterfield, Portland, Or.
550,743.—GAS ENGINE IGNITER—T. G. Cantrell, S. F.
550,710.—IRRIGATION GATE—J. M. Eads, San Bernardino, Cal.
550,711.—IRRIGATION GATE—J. M. Eads, San Bernardino, Cal.
550,718.—BICYCLE BELL AND BRAKE—W. A. Hay, S. F.
550,730.—GATE—C. A. Huffmaster, San Leandro, Cal.
550,721.—ROTARY ENGINE—J. D. Keller, Santa Clara, Cal.
550,688.—ELECTROTHERAPEUTIC APPARATUS—C. Palmleaf, Seattle, Wash.
550,696.—CAN—M. L. Schlueter, Oakland, Cal.
550,927.—PILE COVERING—C. H. Staniforth, S. F.
550,922.—CONDENSER—H. H. Tracy, Hollister, Cal.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

VEHICLE BRAKE.—Jorgen Christensen, San Francisco, Cal. No. 550,067. Dated Nov. 19, 1895. The object of this invention is to provide a brake for bicycles and other vehicles, and it consists in applying a retarding pressure upon the rim or tire of the vehicle by means of rollers, which rotate in contact with the rim, and having means for increasing the friction and retarding their rotation directly in proportion as pressure is applied to force them against the rim. These rollers are mounted upon shafts which converge upon opposite sides of the wheel, said shafts being flexibly united at their upper ends, having their lower ends slidable in guides, a means connected with the jointed ends of the shafts for tilting the shafts so as to move them in lateral planes to or from the wheel rim, disks pressing against the upper and lower ends of the rollers and springs surrounding the shafts and compressible between the guides through which the shafts are slidable.

SOLDERING MACHINE.—M. Jensen, Astoria, Or., assignor of one-half to the Jensen Can Filling Machine Co. No. 550,176. Dated Nov. 19, 1895. This invention relates to improvements in machines for soldering cans. In consists in the combination of an endless carrier adapted to revolve the cans, of revolving wipers rotating in contact with the soldered surfaces, a beader or headers with which the cans form contact after leaving the solder bath, to prevent the solder from hardening until after the surplus has been wiped off, supports for retaining the cans in contact with the beating plates as they are advanced to the wipers. It also consists in improvements in the wipers, which are formed with curved elastic arms projecting outwardly from the central hub, having their wiping surfaces composed of suitable flexible fabric so that the rotation of the wipers will force these surfaces yieldingly against the joints which they are to wipe and clean.

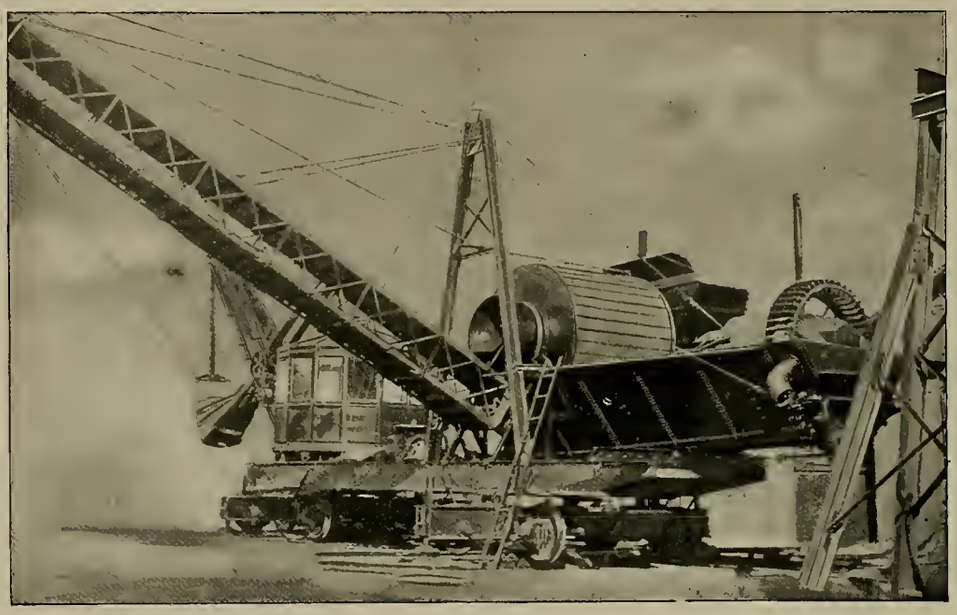
WAGON LOADER.—George M. Wallace, Yuba City, Cal. No. 550,426. Dated Nov. 26, 1895. This invention relates to earth-handling machines, variously termed "excavators," "ditch diggers," "levee builders," etc., and because of the special object for which this machine is adapted the inventor has termed it a "wagon loader," by which is meant a machine capable of loading a wagon with dirt, whether in the process of excavating for ditch-making or levee-building or the transportation of dirt from one place to another, to consummate a work either at the beginning or at the end. The machine belongs to those devices in which one of the wheels is a large one and is provided with a series of receptacles adapted to receive the earth from a plow and to raise it to a point above, where it is delivered to the devices by which its final disposition is made. The machine consists, in general, of a carrier wheel having a series of shoe-like pockets or buckets in its periphery, the entrances to which lie in the direction of rotation of the carrier wheel; gates or doors pivotally secured to the wheel on the outer face and adapted to control the discharges of the buckets or pockets, and a means for automatically opening and closing the doors or gates.

GAS GENERATOR.—August Harding, Oakland, Cal., assignor of one-half to the Golden State and Miners' Iron Works of San Francisco, Cal. No. 550,410. Dated Nov. 26, 1895. The object of this device is to furnish a gas supply to the engine, constant and equal in quantity, thereby insuring the proper quality of its mixture with the air drawn in by the engine. The generator consists of a jacketed casing having an inlet and outlet; a shaft in the casing, having radial arms with their outer ends bent to form scoops, whereby the oil is thrown against the inner wall of the casing; a scraper on the shaft, operating directly against the wall of the casing, to provide an equal distribution of the oil; a supply pump having a pipe connected with the inlet of the casing, and a second pump having a pipe connected with the outlet of the casing and having a discharge pipe for the vaporized fluid. This generator is especially useful in connection with that type of explosive engines in which a plurality of cylinders are used, making it important that the supply of the explosive mixture, both in quality and quantity, shall be equal to all the cylinders.

Electrical Progress.

Amalgamator Operated by Electric Motors.

An application of electricity of interest to the mining industry has recently been made in the adaptation of electric motors to the operation of a Bennett amalgamator. The amalgamator consists essentially of the following parts: A truck and frame for supporting the larger part of the machine, arranged to be run forward on a track as the work progresses; a turntable supporting a boom and dipper; the latter two for excavating the dirt, and a revolving cylinder or screen with a hopper, into which the earth is thrown from the revolving screen, the finer material passing through into the amalgamator and the coarser material being discharged at the end of the drum into the tailings carrier. The amalgamator is a large trough in which the finer material, after passing through the screen, is amalgamated. In the bottom of the amalgamator is an agitator which moves backward and forward, keeping the material stirred up well; also a wheel for raising and discharging the fine tailings after the removal of the gold. The four motors used in operating this machine have been supplied by the General Electric Company, and are so constructed as to be thoroughly protected from water or dust. One of these motors is mounted on the frame of the machine betweeu the turntable carrying the cab, and the revolving screen. It is geared to a shaft connected by a sprocket chain to the revolving cylinder, the tailiugs carrier, the agitator in the amalgamator and the wheel for discharging the tailings at the outer end of the amalgamator. A clutch is provided to throw it into gear with the trucks for moving the entire machine backward and forward.



BENNETT AMALGAMATOR OPERATED BY ELECTRIC MOTORS.

The second motor is placed in the cab and operates the dipper by means of a fine wire rope, passing around the drum to which the motor is geared.

The third motor is mounted on the dipper boom and is geared to a drum placed just above it. Fine wire ropes pass around this drum and are attached to both ends of the dipper handle. The dipper may thus be thrust out or in, according to the requirements of the work.

The fourth motor occupies a place in the cab and drives the turntable by means of a beveled gear and large sprocket chain. This motor is also used to swing the dipper boom around from the front of the amalgamator to a position which allows of the dirt being thrown into the hopper of the revolving screen. The motor operating the cylinder, the tailings carrier and the agitator in the amalgamator runs continuously when the machine is in operation, and is provided with a simple starting rheostat only. The other three motors are controlled by reverse rheostats in the cab, and are handled by one man.

M. MOSKOWITZ has a system of electrically lighting railroad trains that is claimed to be practical. He says by it each car in a train can be lighted by the power at present wasted in the friction of the axles, a dynamo being built over the truck, the armature resting directly on the axles. He says a dynamo of 1½ H. P. will "automatically generate electricity after the train attains a speed of ten miles an hour;" that "half of the electricity generated will be conserved by the lights; the rest passes to storage batteries, where, in a run of seven hours, sufficient electricity can be stored to light the car for twelve hours after it has stopped." Some of Mr. Moskowitz's statements appear difficult of consummation.

A New Electric Drill.

Many electric drills have been found too weak for hard rock. A machine has appeared which seems to meet all the requirements of the most exacting drill work. It has been tried in a hard quality of blue and gray limestone, quite seamy, and on that account somewhat difficult to drill. Two sizes of machines were used, the larger size drilling holes 6 to 8 feet iu depth and 2½ inches in diameter, the smaller size, of 1¼ inches diameter, entering about 20 inches. The average performance of the large machine was about 60 feet of hole in teu hours, although the machine has drilled over 100 feet in the same time. The small size drill, which was handled by one man, did, on an average, over 100 feet of 1¼-inch hole in ten hours. No expert help was required in the maintenance of the plant, and the drill runners were paid no higher wages than the ordinary quarrymen. The extreme simplicity and strength of construction of this drill seem to adapt it pre-eminently to mining work. If the drill runner should be careless, and fail to feed the machine up to the rock, no injury can result, as the plunger is automatically cushioned, electrically, in case the stroke becomes too long. Another peculiarity of the machine is that its stroke can be shortened indefinitely. The machiue may be fed up to the rock until the stroke of the plunger is a quarter of an inch or less, but the plunger will work with the same regularity in speed and motion as when running with a full 6 or 8-inch stroke. The lineal feet of 2½-inch holes cut by one of these drills in one year extended three miles. In the same time it excavated 408,000 tons of hard blue and gray limestone rock. The temperature of the air since the drill was operated has ranged between 110° above and 10° below Fahrenheit.

A SIMPLE and effective appliance has been brought out which will be of great service in making knowu the presence of metallic specks in the eye, although its principal use will be in the locating of bullets or pieces of metal in flesh wounds. The device consists of one piece of copper and one of zinc, to which are attached wires leading to a probe. The probe is in two parts, insulated from each other by vulcanized rubber, the distance between the parts be about 1-100 of an inch. The prongs of the probe are inserted in the electrodes of the battery, the copper disk is placed in the mouth between the cheek and teeth, and the zinc disk rests on the tongue, the metals not being allowed to touch. Both hands are then free to use the probe. When the points of the probe touch metal simultaneously the circuit is completed, there is a spark, and at the same moment electricity will be tasted on the zinc. The electrical coudition of some persons is unfavorable to the development of this peculiar taste; in such cases the indication of the contact can be secured by inserting a telephone in the circuit. As soon as the probe touches a bullet or a piece of metal a distinct click will be heard in the telephone. If desired, the metal strips can be placed in a tumbler of water, and the effect will be the same. This probe is being used by the medical profession with great success.

ANSWERS have been filed at Sacramento in the suits brought by the Western Electric Company against the Capitol Telephone and Telegraph Company for alleged infringement of patents. The local company claims to have 530 subscribers, 100 more than the Bell Exchange, and that the suit has been brought for purposes of business embarrassment. The complaining company claim that the Capitol Company has infringed the Firman patent, for an improvement iu the multiple switchboard, and the Watson patent for an arrangement of the switches in the telephone.

THE Union Iron works will build the triple expansion vertical engines for the electrical plant in the new Parrott building on Market street, this city. There will be six 100 K. W. generators and two 30 K. W. generators. It is expected to comprise 350 arc and 5000 incandescent lights. There will also be fifteen electric elevators.

IT will take 2,112,000 feet of copper wire for the power transmission from the San Joaquin to Fresno.

IT is figured that in '95 the aggregate yield of cotton will be 3,500,000,000 lbs.; wheat, 30,000,000,000 lbs.; corn, 78,888,000,000 lbs.; oats, 26,415,808,000 lbs.; rye, 1,516,000,000 lbs.; barley, 3,378,448,000 lbs.; buckwheat, 76,500,000 lbs.; potatoes, 18,000,000,000 lbs.; hay, 100,000,000,000 lbs.; miscellaneous vegetables, rice, tobacco and dairy and pork products, 500,000,000,000 lbs. more; the grain and cotton tonnage may therefore exceed 163,774,756,000 lbs., or 81,887,378 tons in the seven products. The iron and coal and other mining and forest productions may exceed any other year and carry the total production and tonnage of the United States in 1895-96 beyond any figure ever before realized by any country.

Scientific Progress.

Recent Chemical Achievements.

In the Patent Office at Washington are bottles containing colognes and various scents, not made from flowers, but from laboratory compounds, counterfeiting the perfumes of the rose and other kinds of blossoms perfectly. Nearly all of them are entirely new. Attar of roses has not yet been produced artificially, but it is in sight. The ethereal oil that gives to the rose its peculiar fragrance is called rhodonol. This oil is found in the common lemon grass and in geraniums. A slight modification is required to transform it into the attar.

Production of artificial musk from coal tar is another triumph of synthetic chemistry. It is likely to drive the real article out of the market before long. Though not the same thing, chemically speaking, its scent is indistinguishable from that of natural musk. The perfumes of all flowers are due to ethereal oils, and before long all of these will be manufactured artificially. Ethereal oils gives to fruits their delicious flavors. There are hundreds of these oils, and every one of them can be counterfeited easily, inasmuch as they are very simple chemical compounds. It does not pay any longer to use real fruit syrups for soda water, inasmuch as all of them can be imitated to perfection with artificial ethers or by mixtures of ethers.

The biggest commercial success in the way of an artificial flavoring is vanalline. This product is keeping down the price of vanilla beans, and it is likely to drive the latter out of the market. Already the chemists are manufacturing oil of banana, oil of pineapple, oil of pear, oil of apple, oil of raspberry, and many others. The essential oil of banana, obtained by distilling the fruit, is identical chemically with the laboratory product. Oil of banana is a compouud of acetic acid and amyl alcohol, the latter being the chief constituent of fusel oil. Oil of bitter almonds has been counterfeited; though chemically different, it has the same flavor as the real.

The chemists now know how to counterfeit lactic acid, which is the sour principle of sour milk. They also make citric acid, which is the sour of the lemon. A recent achievement of great importance is the manufacture of salicylic acid from carbolic acid. One of the best remedies for gout and rheumatism is salicylic acid; it is also useful as a preservative. Formerly it was obtained from the wintergreen plant and from certain varieties of willows, and was very costly. At present it is made by the ton, and is extremely cheap—too chep, in fact, inasmuch as it is freely employed to give a better keeping quality to bottled and otherwise preserved foods. It kills the bacteria that produce decomposition, but in the stomach it destroys the digestive ferments, and on that account it is injurious to health.

How it is possible to measure wind by its sound has been told by Prof. Carl Barus to the National Academy of Sciences. The whistling of the wind as it crosses a wire varies with the velocity, and this can be computed from the pitch of the note observed in case of a given diameter of wire and for a given air temperature. A special micrometer attachment can be made to convey the sound, isolated from other noises, to the observer at a distance. Every gust and variation of the wind can be studied in this way, and an idea of the direction of the gust

can he had from the sounds obtained from three wires placed at right angles to one another. Micro-aulmometry is the name proposed for observations hy this method.

AT the last meeting of the Technical Society of the Pacific Coast, on the 6th inst., Otto Von Geldern read a paper on an improved theodolite, and exhibited the practical workings of the instrument, which is termed a cyclotome. J. C. Pelton read a paper on "Released Ashlar," arguing the use and beauty of that style of building and showing the manner of arrangement of the hewn and polished stone.

LIQUID AIR is now an article of commerce and is expected to prove of value not only for refrigeration, but as a source of oxygen. Nitrogen is eliminated until the product contains 70 per cent oxygen.

CHALK SLABS are now converted into marble in the workshop hy an imitation of Nature's processes—coloring with mineral stains, and hardening and crystallizing in a suitable hath.

"THE AUTOCAR" is the hest name yet proposed for the horseless carriage.

Mechanical Progress.

Horseless Carriages.

The fact that there were over fifty entries in a recent horseless carriage contest at Chicago shows the widespread interest manifested hy inventors and different motor manufacturers in the event. Many of the vehicles entered never came to the starting post, hecause their inventors relied upon getting more work out of the machines which they proposed to make than they put into them. Among that class may he mentioned the machines run hy coiled springs, expected to rewind themselves going down hill, and various types of cylinders, expected hy their inventors to he cold when nature prescribed that they shall he hot. Gasoline engines, energy derived from storage batteries, compressed gas suhstituted for liquid gasoline, were among the most noticeable.

All the gasoline engines were constructed upon the same principle, though they had each a different measure of success in practical working. In some instances an oil as heavy and uon-inflammable as ordinary kerosene was used. In others, a much lighter and more inflammahle oil has to be used. The oil is first distrihuted in a fine spray in a heated chamber until it hecomes vaporized. It is then mixed with air until the mixture forms an explosive compound, which is set on fire either hy a lighted jet, hy a spark of electricity, or hy the heat of the combustion chamher. In the latter case outside heat has to he applied until the machine has been working long enough to make its contained gases self-igniting. Beyond the explosion chamher is a piston connected hy a rod with the fly-wheel, toothed-wheel, or axle. The machine is arranged so that an explosion occurs when the piston is down the cylinder as far as it will go. The immense expansion of the gases drives the piston violently up to the top of the cylinder, at the same time opening valves for the admission of another supply of air. When the piston returns to the hottom of the cylinder another explosion takes place, with the same result.

This is the principle of an ordinary gas engine using oil as a suhstitute for gas. In a stationary gas engine, however, there is no pressing demand for economy of space, and no lack of water to keep the cylinder as cool as it ought to he in order to get the hest results. To economize space some inventors have suhstituted double cylinders and pistons in place of single ones. They have also so perfected their apparatus that as long as the water which surrounds the cylinder keeps merely at the holling point and does not evaporate so rapidly as to turn into steam as fast as it touches the cylinder, the piston does not choke in the cylinder, and fresh water can he added to the reservoir every few hours. To get rid of jerkiness, inventors have adopted high speed and very small explosions for each revolution. There remains only the smell, which inventors have got rid of hy making the valve for the admission of air large enough to produce perfect combustion. When this is done properly there is no more smell from a galoline engine than from a well-trimmed kerosene lamp.

The motor of a horseless carriage is one part, the revolving and steering mechanism another. If storage hattery cells of any of the common types are used instead of a gasoline motor, the chief difference is in the weight of the cells and in the use of armatures rotating within fixed field magnets to give the motion instead of the crank of a gasoline engine.

The race referred to was run in snow, slush and mud, and won hy the Dureya Wagon Co.'s gasoline motor, on a 108-mile course in ten hours.

The Fort Point Batteries.

Local scientific interest during the week was centered in the official test of the Fort Point hattery (the largest aggregation of dynamite guns in the world) and in the 800 H. P. air compressors which furnished the power. The air test was made last Thursday, and was satisfactory. In the process of compression the air is first compressed to 75 lhs., then to 375 lhs., then to 2000 lbs., or ahout one one-hundred-and-fortieth of its ordinary hulk. The weight of air has often heen tested hy compressing it in receptacles hy the air pump. Elahorate experiments on the weight of air show that one cuhic foot weighs 536 grains, or something less than one and one-quarter ounces. The ahove is reckoned at the surface of the earth, temperature 50° Fahr. Heated air, or air at high elevation, is of course much lighter. This would make a cuhic foot of compressed air in the tweuty-four steel reservoirs at Fort Point weigh 75,040 grains—over ten pounds.

The guns were tested on the following day. They are three in numher, each fifty feet long, fifteen-inch hore, range 7000 yards. Each projectile weighs 1148 pounds and contains 520 pounds of dynamite. Every test was satisfactory and the result in each case exceeded the utmost requirements of the Government inspector. The first shot delivered the shell 3200 yards in nine seconds. The accuracy of the range also was illustrated. The area of the water surface covered is platted on a scale of 100 yards to the inch. By signals and the use of the new hattery 500 pounds of dynamite can be dropped on a vessel attempting to cross any of the surface, the hattery itself heing invisible from any possihle point of attack. The huilding, construction and placing were all done hy local machinists and engineers. It is California work and protects the Golden Gate ahsolutely. The air-compressing machine was constructed hy the Fulton Engineering and Shiphuilding Works of this city.

Solidifying Petroleum.

Paul d'Humy, a French naval engineer, has a method of converting petroleum to a hard mass, suitahle for fuel on hoard large ocean-going boats. It is claimed that this material is affected neither hy heat nor cold, and is absolutely smokeless and odorless. The cakes, when set on fire, hurn only on the surface, and give an intense heat. They require very little draught and make not more than from 2 to 3 per cent of ashes. They can he made in any size or shape, and can he stored anywhere without danger, as they cannot evaporate or cause an explosion. It is stated that a man-of-war having 1000 tons of this solidified oil on hoard could sail around the world or remain at sea for months together. One ton represents thirty tons of coal, and the cost is represented in a French scientific journal at not more than $10 per ton. It is calculated that in the manufacture of steel 500 pounds of solidified petroleum, costing a little over $2, would melt a ton of metal. If half what is said of the new solidified petroleum is true, the way is opened for all sorts of marine possihilities.

THE Bethlehem, Pa., Iron Works has heen awarded hy the Russian Government a contract for the manufacture of nearly 12,000 tons of armor plate, to he used on the new hattleship Bostislav. It calls for 1126 tons of Harveyized armor, and is one of the largest contracts for armor plate awarded hy any nation in recent years.

Practical Information.

THE commercial micas are: Muscovite (white mica), phlogopite (amber mica), hiotite (black mica). Muscovite occurs in greatest quantities in granites and gneiss. Phlogopite is generally associated with magnesian limestone and pyroxenic rocks. Muscovite is used for stove panels. For this purpose it must he clear and free from spots. The hest muscovite is of a ruhy wine color when it hlocks. The white color comes next in value. The sizes of the sheets most desired for commercial purposes are 1½x2 inches up to 8x 10 inches. Phlogopite is used for electrical purposes, and must he smooth, free from wrinkles and crevices. It must split easily, and it must be very flexihle and ahle to stand a very high temperature without disintegrating; dark spots lessen its value. Waste mica is ground and used as a lubricant for heavy hearings, in certain insulating compounds, for decorating wall papers, and as a fertilizer. Scrap mica is made up into large sheets hy a process. Mica is hest mined hy hand, as machinery is more liahle to injure the sheets. The mineral is hlasted, sorted, split to the correct thickness, and then trimmed and packed for the market in paper packages weighing one pound. As a rule, only four per cent is hrought into a marketahle form, so that the waste is enormous.

A SURPRISING discovery has lately heen made in Amsterdam, Holland, of some very old maps made hetween 1705 and 1719, showing the regions in central Africa which have in modern times heen rediscovered hy Livingston and Stanley. The maps are hased on information furnished hy Portuguese traders, and are surprisingly accurate. The course of the Congo river, under another name, is laid down. The maps are accompanied hy writings giving informatiou derived from the blacks of the great lakes which form the sources of the Nile, and which Livingston and Stanley called the Victoria Nyanza. All the modern discoveries were made hy men who did not know that this territory had heen to some extent explored and mapped nearly two centuries hefore. The Zamhesi territory was hetter known to the Portuguese in 1700 than it is to modern discoverers. They had considerahle settlements at the mouth of the Zamhesi river, hut these were overthrown hy wild hordes of blacks, and all trace of them has long since heen lost.

IN ahout twenty-two seconds a drop of hlood goes the round of the hody. In about every two minutes the entire blood in the hody makes the round through the right side of the heart, the lungs, to the left side of the heart, through the arteries, the veins, again to the heart.

THE Schenectady Locomotive Works are using for certain parts what is called "steeled iron," a mixture of 70 per cent good iron and 30 per cent steel, of which the castings ohtained are about 25 per cent greater in strength than common cast iron.

MATHEMATICAL calculations show that an iron ship weighs 27 per cent less than a wooden one, and will carry 115 tons of cargo for every 100 tons carried hy a wooden ship of the same dimensions, and hoth loaded to the same draught of water.

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References:
Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.
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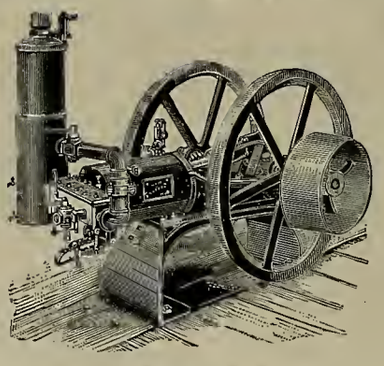
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Coal Gas, ten houre' run, 1000 feet	$2 00
Gasoline (74 deg.), ten hours' run, 8¾ gallons @ 14c	1 25
Coal Oil, ten hours' run, 7½ gallons @ 10c	75
Crude Petroleum, asphaltum base, 16 gallons @ 3c	48
Crude Petroleum (36 deg.), paraffine base, 13 gallons @ 5c	65

On the crude petroleum with asphaltum hase we had an over-product of 7 gallons of asphaltum; the market price is 3 cents per gallon—21 cents. This deducted from the first cost of the crude petroleum for ten hours' run leaves a net halance of 27 cents. And from the crude oil with a paraffine base we had an over-product of 3 gallons of good lubricating oil, which we consider equal to any we have ever used, hut will estimate its value conservatively at 20 cents per gallon, making 60 cents; this deducted from the first cost of the crude oil leaves a halance of 5 cents, total cost of running ten hours.

It will be readily seen that the operation of these Engines with crude petroleum reduces the cost of operation to aminimum. Crude petroleum with paraffine base at 1-10c per horse power per hour; on crude petroleum, asphaltum hase, ¼c per horse power per hour; on domestic coal oil, 1½o per horse power per hour; and on gasoline, 2½c per horse power per hour.

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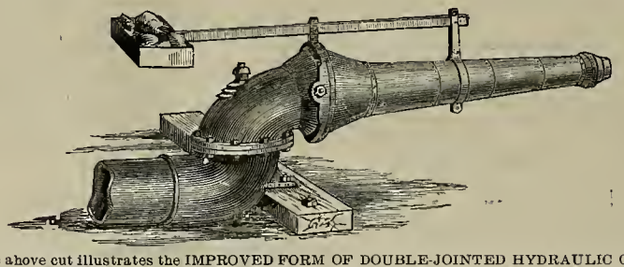
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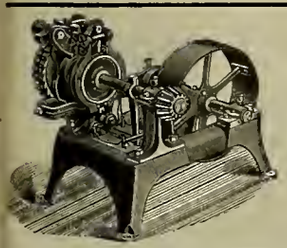


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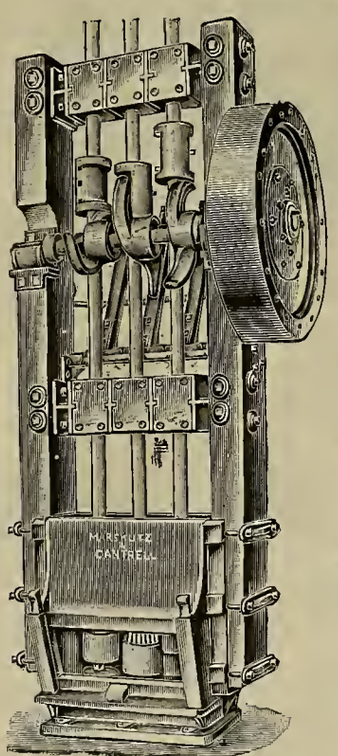
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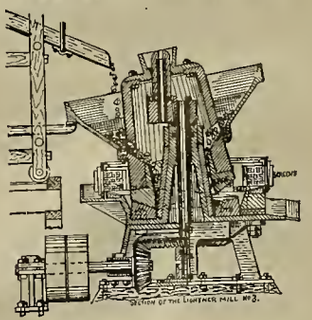
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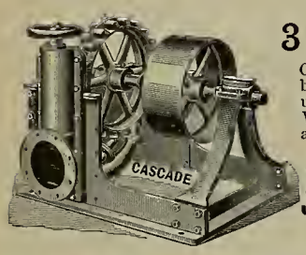
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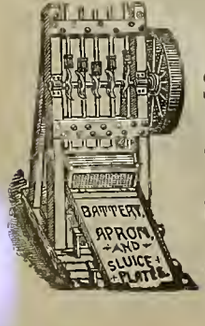
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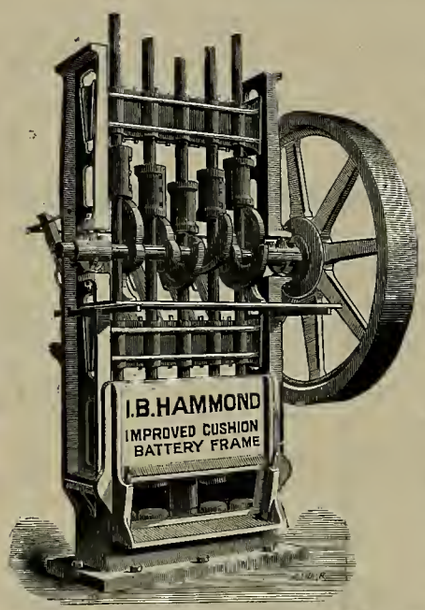
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The Improved, Iron-Frame, Self-Contained, Cushion-Frame, Five-Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space. The term "Self-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

FIRST: There is Saved by the Use of This Mill a Large Bill for Heavy Timbers, in Many Instances Obtained at Great Expense and Loss Of Time.

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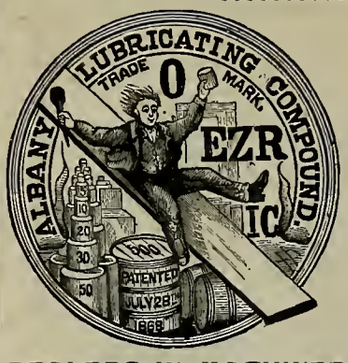
THIRD: The Large Amount of Space Saved.

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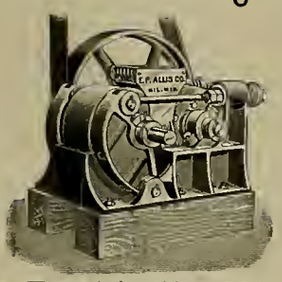
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LIGHT STEEL RAIL.

Market Reports.

The Markets.

SAN FRANCISCO, Dec. 12, 1895.

Everything is down this week. Silver has dropped to 65¼. In New York the drop is ascribed to the fact that the Chinese indemnity to Japan, which so far as paid was deposited in the Bank of England, has been turned over to the Japanese Government, which, instead of spending it for the purchase of silver for use in Japan, as expected, is now lending it in the London market. This is construed to mean that the money, which was paid in gold, will be expended in Europe, probably in the purchase of warships and material. This is disappointing to London silver speculators, who are now "unloading."

Iron and steel are reported weak in Eastern and Western markets. Manufacturers are unable to induce consumers to believe that now is the best time to buy. In pig iron Philadelphia reports: "Very little business has come to light, notwithstanding a drop in selling prices. The reaction is fast spending its force. Everybody is waiting for bottom to be reached. To-day it looks as if prices must go lower, because production is, in fact, increasing and new orders are rare. The expansion of production was of such dimensions as to demand an extraordinary activity on the part of railroads. There are no signs of improvement in that quarter. The furnace production will overstock the market in a short time at this rate. The bar and sheet mills are buying very moderately. As to future wants, nothing is said or done. No. 1 Foundry is offered at $13.75 and less. The rush has subsided at the foundries, but the larger concerns all look for better things after the new year. No. 2 runs from $12.75 to $13.25. Standard forge is $12 to $12.50; ordinary, $11.75. A lot of low phosphorus sold at furnace this week at $18.25. Brokers' furnace agents admit their recent experience has been unequaled. In some quarters a dread of the future is expressed, but it comes from those interests that must suffer when pig iron production declines below the 200,000 tons per week limit."

R. G. Dunn & Co. report from New York: "The average of all quotations is 8⅛ per cent below the highest point in September, but actual sales are frequently made below quotations. Proposed combination of lake ore producers has not yet been effected and with the fall in the price of iron is less probable. There is more pressure to sell Southern pig here and some large transactions have been made by concessions, while the small demand has broken the harded wire combination, and the two nail and two har associations are now in session to consider their policy. Rails have not changed, while Bessemer pig has declined $5 and billets $6 per ton, and a purchase of 10,000 tons for San Francisco from England is noticed, with a considerable importation of wire nails at Boston. Copper is weaker at 11 cents for lake, with narrow demand, and tin a quarter weaker, with the visible supply here and abroad 29,231 tons, against 22,445 tons a year.

New York Metal Market.

NEW YORK, Dec. 12.—PIG IRON—Southern, 12@12.50; Northern, 12@13.00.

COPPER — Brokers', 10.80c; exchange, 10.65c.

LEAD—Brokers', $3.27½; exchange, $3.25.

TIN—Straits, 13.75@14.00c.

SPELTER—Domestic, $3.55.

New York Silver Prices.

NEW YORK, Dec. 12.—Followiug are the closing prices for the week:

	Silver in London.	N. Y.	Copper.	Lead.
Friday	30¾	67	10 75	.....
Saturday	30⅝	66⅞	11 00	3 20
Monday	30¼	66½	.....	3 25
Tuesday	30⅜	66	.....	.....
Wednesday	30⅛	66	10 80	3 25
Thursday	30	65½	.....	.....

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	2½c
New York Telegraphic Transfer	5c
London Bankers' 60 days	$4.88¼
London Merchants	$4.86½
London Sight Bankers	$4.89½
Refined Silver, per oz., 1000 fine	65¼c
Mexican Dollars	54c

San Francisco Metal Market.

COPPER.			
Bolt	¼ & 5-16, 21c; ⅜ and larger, 22c		
Lake Superior Sheathing	23	@	—
Ingot, jobbing	—	@	19
Ingot, wholesale	18	@	—
Sheet copper	—	@	22
ZINC.			
Sheet	9½@		
LEAD.			
Pig	—	@	3 85
Bar	—	@	4 15
Sheet	—	@	5 50
Pipe	—	@	4 75
SHOT.			
Drop, sizes *smaller* than B, per bag of 25 lbs			$1 40
Drop, B and *larger* sizes, " "			1 65
Buck, Balls and Chilled, do, " "			1 65
IRON.			
American Soft	22 00	@	26 00
Pig, per ton	18 00	@	20 00
STEEL.			
English, lb	16	@	19
COKE.			
Gas Companies'	75c ℔ bbl.		
English, to load	9 00	@	10 00
" spot, in bulk	—	@	13 00
" in sacks	—	@	15 00
Cumberland	9 00	@	— —
ANTIMONY.			
Per lb	—	@	10¼
PIG TIN.			
Per lb.	15	@	16 00
QUICKSILVER.			
Home trade, per flask	39 00	@	40 —

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied, Delinq't and Site.			Secretary.
Best & Belcher M Co, Nev	59	25c	Nov 4,	Dec 9,	Dec 30	M Jaffe, 309 Montgomery
Bullion M Co, Nev	46	10c	Nov 4,	Dec 9,	Dec 30	R R Grayson, 331 Pine
Bulwer Con M Co, Cal	11	5c	Oct 29,	Dec 4,	Dec 31	C E Elliot, 309 Montgomery
Con Cal & Va M Co, Nev	5	25c	Nov 22,	Dec 28,	Jan 16	A W Havens, 309 Montgomery
Confidence M Co, Nev	26	30c	Nov 13,	Dec 18,	Jan 8	A S Groth, 414 California
Chollar M Co, Nev	41	25c	Nov 12,	Dec 17,	Jan 7	C E Elliot, 309 Montgomery
Exchequer M Co, Nev	38	5c	Oct 21,	Nov 25,	Dec 19	C E Elliot, 309 Montgomery
Gold Bar Con M Co, Cal	2	8c	Nov 5,	Dec 21,	Jan 16	E C Godfrey, Crocker Building
Gould & Curry S M Co, Nev	77	15c	Nov 5,	Dec 10,	Dec 30	A K Durhrow, 309 Montgomery
Hale & Norcross S M Co, Nev	108	15c	Dec 10,	Jan 15,	Feb 7	A B Thompson, 309 Montgomery
Iowa Mining Co, Nev	21	5c	Oct 23,	Nov 26,	Dec 16	R L Thomas, 419 California
Jamison M Co, Cal	7	2c	Nov 9,	Dec 16,	Jan 6	S W Cheyney, 120 Sutter
Marguerite M Co, Cal	1	10c	Nov 2,	Dec 2,	Jan 5	Chas. Winters, 237 12th St., S F
Mexican M Co, Nev	53	25c	Nov 19,	Dec 23,	Jan 14	C E Elliot, 309 Montgomery
Ophir S M Co, Nev	67	25c	Nov 5,	Dec 9,	Dec 30	E B Holmes, 309 Montgomery
Overman S M Co, Nevada	74	10c	Dec 2,	Jan 6,	Jan 27	G D Edwards, 414 California
Superior M & M Co, Cal	1	5c	Nov 5,	Dec 9,	Dec 30.	J Howard Barnard, 916 Market, S F
Yellow Jacket M Co, Nev	60	25c	Nov 12,	Dec 17,	Jan 22	W H Blauvelt

MEETINGS.

Company and Location.	Secretary and Office in S. F.	Date
Andes S M Co, Nev	J W Twiggs, 309 Montgomery	Dec 18
Gould & Curry S M Co, Nev	A K Durhrow, 309 Montgomery	Dec 16
Ophir S M Co, Nev	E H Holmes, 309 Montgomery	Dec 18

BORAX.

Refined, in car lots	—	@	5⅛
Refined, in sacks and barrels	—	@	5⅝
Powdered, in car lots	—	@	5⅜
Concentrated, "	—	@	4⅞

TIN PLATE.

Per bx	4 75	@	5 00

ZINC.

Sheet	8½@		

NAILS.

Wire	$1 75
Cut	1 50

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming	17 00	@	— —
Pine	13 00	@	18 00
Spruce	25 00	@	30 00

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00
Greta	7 50
Nanaimo	7 00
Gilman	6 50
Seattle	6 00
Coos Bay	5 00
Cannel	8 50
Egg, hard	10 00
Wallsend	7 50
Scotch Splint	6 50
Brymho	7 50

TO ARRIVE—CARGO LOTS.

Australian	5 35
Liverpool Steam	5 87
Scotch Splint	6 00
Cardiff	6 00
Lehigh Lump	9 00
Cumberland	8 50
Egg, hard	10 00
West Hartley	6 50

Mining Share Market.

SAN FRANCISCO, Dec. 12, 1895.

The market the past week suffered another shrinkage in values, under the lead, on the down grade, of Hale & Norcross and Occidental. The decline in these two did not create surprise with those informed on the way in which the market is being manipulated, particularly those who have kept informed on the reports of the market as they have appeared from week to week in the MINING AND SCIENTIFIC PRESS. The writer has not allowed an opportunity to pass to impress on traders the absolute necessity of exercising the utmost care in dealing, for, so far as all outward signs go, there does not appear anything to warrant the assertion that strong, moneyed men are in the market. Everything, so far, points to a few outsiders, who are perhaps aided by two or more brokers being in the market. These parties or others of a similar character have, on several different occasions, made like attempts to advance prices, but with dire disaster to dealers who bought in expectation that the long-promised big deal was at hand. While saying this, it must not be understood that the situation at the mines does not warrant a higher range of values, but there is no large combination prepared to back the proposition; and until this does take place, the market is dangerous to operate in. It seems as if the shares in one or two mines are taken up, and, through cross orders and well-circulated bull points, are advanced, and then as suddenly, if not sooner, the market is allowed to give way, carrying the entire list down, but the shares unduly inflated break back the most. This system or way of manipulating, it looks at this writing, is not through with, but what will he taken up next it is hard to say. That others will be taken up is a moral certainty, and that they will let them go off quickly, after an advance has been made, goes without saying. The break in prices was brought about by assessment scares and other hear reports. Fears of assessment are held up to stop any hull movement in the same way that a red flag is displayed to stop a train of cars.

The news from the Comstock mines is uniformly good, and under normal conditions the market value of shares would he considerably higher than at present. In the Alta group the work does not seem to he pushed with that vigor which it was confidently expected it would be, but well informed and conservative mining men think that it could not he done more expeditiously and at the same time to the best interest of shareholders. That the Alta mine is being put in good condition for future work is conceded hy all. In the Gold Hill mines there is no change in the character of the work since last week's report. From all that can he learned, developing work is under way in two or three, while exploiting work is being pushed in the others. This work is towards the west, and therefore quite important. Much of it, probahly, could he dispensed with. It looks as if the superfluous work is being done for the purpose of depleting the cash reserve, and low finances mean assessments. In the very nature of things this procrastination would seem to point to the fact that the outside public hold considerable stock and are willing to pay assessments. So long as they are, there is no doubt of their being accommodated. There are well informed operators who are quite confident that before any large body of ore is shown up market values will rule quite low and the market be greatly depressed. Yet who can tell with certainty, for almost any day the miners' picks may run into ore which may develop into a sufficient body to draw in moneyed men. In Belcher, Seg. Belcher, Crown Point, Yellow Jacket, Challenge, Confidence, Con. Imperial and Alpha the work is heing closely watched, hut it is not expected that anything of very great importance will he struck for some weeks yet. This work is towards the west. In the middle group they are still extracting ore in Potosi and the returns from the milling net a profit. The work being done in these mines is said to he quite important, hut time will he required before results can he fully determined.

In Gould & Curry and Best & Belcher there is no particular change in the situation. In Con. Virginia there is an improving prospect and it is expected that hetter reports will begin to come to hand. The work is being prosecuted on several levels, and in directions which ought to give good results. In Ophir and Mexican there are no changes to note, hut from the character of the work it is thought that the groundwork is being laid for important work to he started next spring. In Sierra Nevada the work attracts some attention, hut experienced miners say it will take considerable time yet before results can be fully determined.

On the Brunswick lode the work is said to he growing in interest at several points, and consequently Occidental is closely watched. While dealers are watching with considerable interest the work under way on that lode, shrewd and well-informed mining men are giving hut little attention to it.

In the outside mining districts nothing of special interest is reported. The work is largely of about the same character as that heretofore reported.

In the Bodie mines the official letters show hut little change from those that have heen written for months past.

The following illustrates the changes of the week:

Mines.	Dec. 5.	Dec. 12.
Alpha	$ 21	$ 19
Alta Consolidated	14	12
Andes	23	19
Belcher	30	28
Best & Belcher	83	80
Bodie	45	40
Bullion	20	16
Challenge	.....	25
Chollar	.....	22
Confidence	.....	72
Consolidated California and Virginia	2 30	2 15
Consolidated New York	.....	.....
Crown Point	28	27
Exchequer	.....	.....
Gould & Curry	28	42
Hale & Norcross	96	86
Justice	05	.....
Mexican	.....	37
Ophir	1 05	1 30
Overman	.....	09
Potosi	60	54
Savage	.....	36
Sierra Nevada	64	60
Union	53	49
Utah	.....	05
Yellow Jacket	.....	18

San Francisco Stock Board Sales.

SAN FRANCISCO, Dec. 12, 1895.

9:30 A. M. SESSION.

654	Alta	12	350 Occidental 61
100	Belcher	28	1050 60
200	Challenge	25	100 Ophir 1 30
100	Chollar	22	100 Sierra Nevada 60
500	Con. Imperial	02	100 Savage 36
300	Crown Point	26	300 35
600	Gould & Curry	42	50 Union 49
100	H. & N	86	200 Utah 05
500	Julia	02	50 Yellow Jacket 17
100	Mexican	37	300 18

SECOND SESSION—2:30 P. M.

100	Ophir	1 25	100	18
100		1 30	1000 Con Imperial	02
600	Mexican	36	300 Alpha	19
25		30	300	18
100	Best & Belcher	80	50 Belcher	27
100		79	50	28
300	Con Cal & Va	2 15	50 Confidence	72
200	Savage	31	300 Utah	04
300		30	500 Bullion	16
200	Chollar	21	300 S Belcher	08
200		20	400 Overman	09
100	Potosi	53	200 Union	48
700		54	400	47
1000	Kentuck	05	200 Alta	10
100	Sierra Nevada	57	200 Challenge	25
250		56	500 Occidental	62
450	Hale & Norcross	83	200 Andes	18
50		82	50	19
200	Crown Point	25	500 Bodie	40
100		27	200	39
200	Yellow Jacket	17		

Assessment Notices.

THE JAMISON MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, on Jamison Creek, near Johnsville, Plumas County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the ninth day of November, 1895, an assessment (No. 7) of two cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 120 Sutter street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 16th day of December, 1895, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on MONDAY, the 6th day of January, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

SAM W. CHEYNEY, Secretary.

Office—Room 50, 120 Sutter street, San Francisco, California.

GOLD BAR CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, near La Porte, Plumas county, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the 5th day of November, 1895, an assessment (No. 2), of three cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Rooms 37 and 38, Crocker Building, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 21st day of December, 1895, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on THURSDAY, the 16th day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

E. C. GODFREY, Secretary.

Office—37 and 38 Crocker Building, San Francisco, California.

CON. CALIFORNIA & VIRGINIA MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the 22d day of November, 1895, an assessment (No. 5) of twenty-five (25) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 48, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of December, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on THURSDAY, the sixteenth (16th) day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. W. HAVENS, Secretary.

Office—Room 48, Nevada Block, No. 309 Montgomery street, San Francisco, California.

CONFIDENCE SILVER MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Gold Hill, Storey county, Nevada.

Notice is hereby given that at a meeting of the Board of Directors, held on the 13th day of November, 1895, an assessment (No. 26) of 30 cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the secretary, at the office of the company, No. 414 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of December, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on WEDNESDAY, the 8th day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

A. S. GROTH, Secretary.

Office—No. 414 California street, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from Wm. A. Roberts and John Graham, in the Forest Home mine, Amador county, to impound tailings behind a dam in Arkansas creek; from James T. Ish, in the Bull Neck mine, near Volcano, Amador county, to impound tailings in dry ravines; from Henry Dickerman et al., in the Mill Gulch mine, near Amador, Amador county, to impound tailings behind a dam below the mine; from John G. Ramm, in the Jay Bird mine, near Camptonville, Yuba county, to impound tailings below the mine; from Schillanskey & Co., in the Wild Yankee mine, Shady Run, Placer county, to impound ta lings behind a dam; from Wm. H. Cole, in his mine in Mountain Tp., El Dorado county, to impound tailings behind dams in a dry ravine; from A. B. Jacks and John Clifford, in the Badger Hill mine, near Spanish Ranch, Plumas county, to impound tailings behind a dam in Woods Ravine; from John Schafer, in the Pine Leaf mine, near Spanish Ranch, Plumas county, to impound tailings in an old pit; from Geo. C. Sargent, in the Gold Hill mine, Nevada county, to impound tailing on a flat south of Deer Creek; from James Meehan, in his mine near Aqueduct City, Amador county, to impound tailings below the mine; from J. N. Flindt, in the Trafton mine, near Yankee Jims, Placer county, to impound tailings below the mine; and from George W. Smith, in the Gold Hill mine, near Oleta, Amador county, Cal., to impound tailings behind a dam in a ravine—gives notice that a meeting will be held at Room No. 32, Flood Building, San Francisco, Cal., on Dec. 23rd, 1895, at 1:30 P. M.

ANNUAL MEETING.—THE REGULAR ANNUAL MEETING of the stockholders of the Gould & Curry Silver Mining Company will be held at the office of the company, room 69, Nevada Block, 309 Montgomery street, San Francisco, California, on MONDAY, the 16th day of December, 1895, at the hour of one o'clock, P. M., for the purpose of electing a Board of Directors to serve for the ensuing year, and the transaction of such other business as may come before the meeting. Transfer hooks will close on Friday, December 13, 1895, at 3 o'clock P. M.

ALFRED K. DURBROW, Secretary.

SPECIAL MEETING.—A SPECIAL MEETING of the stockholders of the Sonora Extended Mining Corporation will be held at the office of the company, 213 Jackson street, San Francisco, California, on MONDAY, the 30th day of December, 1895 to consider and order on an offer to purchase the plant of the mine and other property of the corporation, and to authorize and empower the directors to sell the same, and to execute or cause to be executed a proper deed of conveyance of said property to the purchaser.

JOHN METCALFE, President.

The Boom Gold Mines.

These mines, fully developed, giving high grade, free milling gold, with all the machinery, mill, buildings, water, must now be sold for a song, to raise money for private purposes. Maps, reports of engineers at command; title clear; no misrepresentation. Investment positively safe. Everything new and complete. Correspondence desired that means strictly business. A splendid chance for a small investment.

CHARLES F. KUHNEN,
Casa Grande, A. T

The California Stump Puller.

The possibility of securing desirable open land on the Pacific slope is yearly narrowing; and, in about the same ratio, there comes a demand for some practicable method of removing trees and stumps from land otherwise valueless, in order that it may be cultivated or placed upon the market.

Right here the "California Stump Puller" comes in with a reputation acquired by several years' practical use, extending through Washington, Oregon, California, Central America and the Sandwich Islands. Though the machine has been subjected to the severest tests under the most trying conditions, it has always come out victorious. For immense pulling capacity, embraced in simple, compact and safe form, adapted to all the irregular conditions of mountainous or level land, this machine has probably no equal.

Numerous unsolicited testimonials are in the hands of the manufacturer, evincing the entire satisfaction the machine has given. The cost is low, and considering the service rendered, the cost would be low at any price. Full details of the stump puller will be found in the illustrated catalogue, and also valuable hints in regard to clearing land generally. Address A. Barnes, General Manager, 82 and 84 Zoe St., San Francisco. See the advertisement on another page. *

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald	453	250	25 00
M J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Luce, Trustee	387	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	469	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	581	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4.000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on November 2, 1895, the above sale is postponed to MONDAY, the 2d day of December, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on December 2, 1895, the above assessment is postponed to TUESDAY, the 31st day of December, 1895, at the same place and time of day.

W. W SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

SUPERIOR MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placerville, El Dorado County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 5th day of November, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
James Black	166	25	$ 1 25
E. J. Bowyer	214	200	10 00
F. M. Dickerhoff, Trustee	75	5,000	250 00
F. M. Dickerhoff, Trustee	76	5 000	250 00
F. M. Dickerhoff, Trustee	77	5,000	250 00
F. M. Dickerhoff, Trustee	79	2,000	100 00
F. M. Dickerhoff, Trustee	80	1,000	50 00
F. M. Dickerhoff, Trustee	81	1,000	50 00
F. M. Dickerhoff, Trustee	82	1,000	50 00
F. M. Dickerhoff, Trustee	88	100	5 00
F. M. Dickerhoff, Trustee	89	100	5 00
F. M Dickerhoff, Trustee	90	100	5 00
F. M. Dickerhoff, Trustee	91	100	5 00
F. M. Dickerhoff, Trustee	93	50	2 50
F. M. Dickerhoff, Trustee	94	50	2 50
E. R. Dickerhoff	6	50	2 50
A. J. Dickerhoff	7	50	2 50
Thos. B. Douglass	95	25	1 25
F. W. Evans	8	50	2 50
M. A. Evans	9	50	2 50
Frank Evans	16	25	1 25
Mamie Evans	17	25	1 25
Cora Evans	18	25	1 25
Frank Goyan, Trustee	37	2,000	100 00
Frank Goyan, Trustee	38	2,000	100 00
Frank Goyan, Trustee	39	2,000	100 00
Frank Goyan, Trustee	40	2,000	100 00
Frank Goyan, Trustee	41	2,000	100 00
Frank Goyan, Trustee	42	2,000	100 00
Frank Goyan, Trustee	43	2,000	100 00
Frank Goyan, Trustee	44	1,000	50 00
Frank Goyan, Trustee	45	1,000	50 00
Frank Goyan, Trustee	46	1,000	50 00
Frank Goyan, Trustee	47	1,000	50 00
Frank Goyan, Trustee	48	1,000	50 00
Frank Goyan, Trustee	49	1,000	50 00
Frank Goyan, Trustee	218	750	37 50
Frank Goyan, Trustee	233	1,720	86 00
John Lord	206	75	3 75
D. L. Munson, Trustee	52	140	7 00
D. L. Munson, Trustee	55	800	40 00
D. L. Munson, Trustee	71	100	5 00
D. L. Munson, Trustee	73	177	8 85
D. L. Munson, Trustee	99	250	12 50
D. L. Munson, Trustee	101	200	10 00
D. L. Munson, Trustee	102	200	10 00
D. L. Munson, Trustee	107	100	5 00
D. L. Munson, Trustee	113	50	2 50
D. L. Munson, Trustee	114	50	2 50
D. L. Munson, Trustee	116	25	1 25
D. L. Munson, Trustee	121	500	25 00
D. L. Munson, Trustee	125	100	5 00
D. L. Munson, Trustee	128	12	60
D. L. Munson, Trustee	129	5	25
D. L. Munson, Trustee	130	5	25
D. L. Munson, Trustee	133	20	1 00
D. L. Munson, Trustee	134	20	1 00
D. L. Munson, Trustee	135	20	1 00
D. L. Munson, Trustee	137	5	25
D. L. Munson, Trustee	140	100	5 00
D. L. Munson, Trustee	144	20	1 00
D. L. Munson, Trustee	150	50	2 50
D. L. Munson, Trustee	155	20	1 00
D. L. Munson, Trustee	156	20	1 00
D. L. Munson, Trustee	162	100	5 00
D. L. Munson, Trustee	163	25	1 25
D. L. Munson, Trustee	183	10	50
D. L. Munson, Trustee	187	5	25
D. L. Munson, Trustee	188	264	13 20
D. L. Munson, Trustee	218	9,265	463 25
D. L. Munson, Trustee	219	1,000	50 00
D. L. Munson, Trustee	222	55	2 75
D. L. Munson, Trustee	229	2,232	116 15
D. L. Munson, Trustee	1(new)	500	25 00
D. L. Munson, Trustee	2(new)	500	25 00
D. L. Munson, Trustee	3(new)	600	30 00
D. L. Munson, Trustee	7(new)	20	1 00
D. L. Munson, Trustee	11(new)	300	15 00
D. L. Munson, Trustee	15(new)	22,224	1,111 20
D. L. Munson, Trustee	18 new)	100	5 00
D. L. Munson, Trustee	27(new)	320	16 00
D. L. Munson, Trustee	28(new)	46	2 30
W. F. Nelson & Son	24(new)	20	1 00
W. F Nelson & Son	29(new)	20	1 00
Mrs. S. M. Overton	14	622	31 10
Leander Silvester	120	20	1 00
Leander Silvester	172	10	50
Leander Silvester	173	10	50
Leander Silvester	16(new)	10	50
Crescenta Whitney	19	25	1 25
J. N. Witherow	171	25	1 25
S. L. Walde	4	50	2 50
Cora Walde	5	50	2 50
Milton Walde	11	25	1 25
Ella Walde	12	25	1 25
Artie Walde	13	25	1 25
Howard Walde	14	25	1 25
A. Walde	15	25	1 25

And in accordance with law, and an order from the Board of Directors, made on the 5th day of November, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, No. 916 Market St., room 81, San Francisco, California, on WEDNESDAY, the 30th day of December, 1895, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

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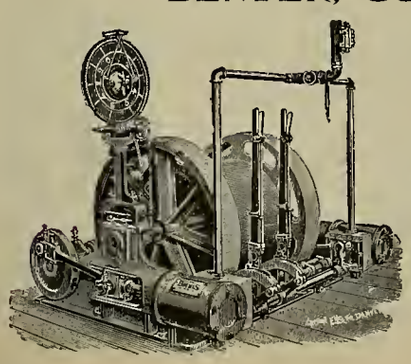
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VOLUME LXXI.
Number 25.

SAN FRANCISCO, SATURDAY, DECEMBER 21, 1895.

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The Chicago Drainage Canal.

The greatest engineering work now being done in the United States is the Chicago drainage canal, costing $30,000,000. Primarily a drainage channel, it will be also a ship canal for vessels drawing twenty-two feet. Work began September 3rd, 1892; it is to be completed April 30th, 1896. Some of the items are striking. Of glacial drift and solid rock 39,547,499 cubic yards are to be excavated. This "glacial drift," of which there are 27,246,656 cubic yards, overlies the solid rock to an average depth of twenty-five feet, and is harder to work than the rock. Pebbles and boulders are cemented together with earth and clay, and after being undermined and blasted the strongest manganese steel tools are quickly dulled and destroyed. After considerable costly experiments McArthur Bros., contractors on this section, after blasting put steam shovels to work in cuts lengthwise of the section, each successive cut going deeper toward the underlying rock. Cars are run on parallel tracks to the steam shovel on a higher level till the bottom cut is reached, when the track is placed on a level with the shovel track. A traveliug cableway plays an important part in the work, and is very economical, saving considerable expense in blasting and quickly and cheaply moving the material. Fig. 1 shows a completed rock cut on section 8, and gives an idea of the cableway referred to. The span is 700 feet; the head tower, on the right, is 93 feet high; the tail tower, on the left, 73 feet. The main cable is of steel, two and one-quarter inches diameter, the other ropes large enough to handle an eight-ton load. An auxiliary rope dumps the skip without stopping the onward movement of the carriage on the cable. The towers are moved by small reversible engines. The cableway has a daily capacity of 600 cubic yards. Its total operating cost is from $15 to $18 per day. Twenty such cableways as that illustrated are in use on the canal.



FIG. 1.—COMPLETED ROCK CUT ON CHICAGO DRAINAGE CANAL.

Fig. 2 shows the manner of building retaining walls. The quarry is located in the canal; two traveling derricks are used, following up the work as the canal is opened. The wall on each side is laid by derricks of similar construction, located in the canal and traveling along the wall as the work progresses. The stone is taken to the traveling derricks on a track running parallel to the wall. The mortar is mixed in a berme near each derrick. The average height of the completed wall is eighteen feet. Wall building is the only part of work that cannot be carried on in freezing weather. The wall is founded on surface one foot below grade, built with batter to make top two feet farther than bottom line from center of canal; face stones not less than 12 nor more than 30 inches thick, laid on their natural quarry beds, equal parts sand and cement. In the quarry each derrick requires engineer, foremau, seven quarrymen and two stonecutters; each derrick on the wall takes an engineer, foreman, five masons, three helpers, two derrick men, two hod carriers, two mortar mixers, two sand mixers and two laborers. The above data is compiled from a description of "Contractors' Methods Employed on the Great Chicago Drainage Canal" by the Lidgerwood Manufacturing Co., 96 Liberty street, New York, to whom we are also indebted for the two accompanying illustrations.



FIG. 2.—BUILDING RETAINING WALLS, CHICAGO DRAINAGE CANAL.

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J. F. HALLORAN.....General Manager

San Francisco, December 21, 1895.

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IT is difficult to understand what useful purpose is served hy the singular action of Congressman McLachlan of the Sixth Congressional district of this State, who has at this late day introduced into the House of Representatives a bill suspending for the year 1895 that portion of the Federal Statutes requiring the annual expenditure of at least $100 in work or improvements on each unpatented miuing claim in the United States. But ten days of this year remain, and presumahly ninety-nine-hundredths of such required work is now done, so that even could such a hill he rushed through the Committee on Mines and Mining, secure immediate passage, he agreed to by the Senate, pass that hody and receive the President's signature, its passage would afford no relief. Such legislation would he manifestly unjust to the thousands of miners who in all the States and Territories have in good faith (many of them being poorly able to afford it) done the required amount of work necessary to legally hold their claims. To he fair and equitable, such a measure should pass earlier in the year. In '93 the suspension-of-assessment act became a law in November; in '94 in July, thus giving all an opportunity of profiting, if they desired, by its provisions. To wait till the last days of the year to which it is iutended to apply is grossly out of place. Its passage can help nohody and would simply put a present premium on sloth, delay, carelessness and fraud. It would also result next year in the general impressiou among miners and prospectors that there was no need to pay attention to the law; that along in the closing days of the year would come a relief bill iu Congress making such work unnecessary, and that it was optioual with the holder if any improvement or developing were done on any unpatented mining claim. The expediency of the measure in general was widely discussed two years ago. The majority of opinion is now against it. More letters have been received on this suhject by the MINING AND SCIENTIFIC PRESS this year than on any other general topic. It was generally supposed when the 53rd Congress adjourned that there would be no suspension of the Statute for this year, and on the strength of that supposition the law has beeu generally complied with. While buncombe is prohahly allowable even among Congressmen, it would work less mischief if applied in some other direction than that taken hy one of our California legislators in introducing and pressing the measure referred to. It is to be hoped that some one on the Miues and Mining Committee will see the absurdity of the proposition and squelch it in the committee room.

State Mineral Lands and Pending Legislation Thereon.

Herewith is published in full the official text of the "compromise" Mineral Lands bill adopted by the Executive Committee of the Miners' Association on December 12th, and of the bill originally reported by the Legislative Committee on November 27th, generally referred to as the "Idaho-Montana bill." The latter is substantially the same as the hill introduced in Congress by Congressman Caminetti in January, 1895, aud which failed to pass the House hecause of the single objection of Congressman Hephurn of Iowa, at the most critical time in its history. It is the same as the act now in operation in the States of Idaho and Montana, where its results are most heneficent and satisfactory. It will be noted that it suspends the patenting of all lands within the limits of the railroad grants until they can he examined and classified by a commission as to their being mineral or uon-mineral in character. The expenses fall ou the Government, where they helong.

Where no protests are filed, the classification reported by the commission is final upon approval of the Secretary of the Interior. Where protests are filed against the classification made by the commission, ample provision is made for protest and hearing in the land office. The machinery of this bill is simple, and the Congressmen from the States to which it applies are loud in praise of its working. It is said that twenty-five per cent of the lands examined have heen saved to the miners, nearly all of which would have been absorbed by the railroads without this hill. Giveu an able and scrupulous commission, the operation of such a bill applied to California would he all that could he asked.

We are informed, however, by the ageuts of the land department of the Southeru Pacific Company that the bill is a failure. We have noticed, however, that this charge comes from no other source.

The old Mineral Lands Committee, composed of Messrs. Ricketts, Wright, Yale, Loftus and Hoffman, expended much of their efforts toward having the provisions of this bill made to apply to California, first by their support of Mr. Camiuctti in his effort to pass the hill in Congress, and afterward in their attempts to induce the railroad company to consent to adopt its provisions as the basis of the agreement so long under negotiation.

The Miners' Executive Committee may do well to remember that the work of the old Mineral Lands Committee *was approved by the Association in the convention at Pioneer Hall in this city last month.* This approval is a demonstration that the association desires the bill presented to Congress to be similar to the Idaho-Montaua act. Following is the bill that would be of benefit to the California miner, but which has been rejected:

A BILL TO PROVIDE FOR THE EXAMINATION AND CLASSIFICATION OF CERTAIN MINERAL LANDS IN THE STATE OF CALIFORNIA.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

SECTION 1. That the Secretary of the Interior be, and he is herehy, authorized and directed, as speedily as practicahle, to cause all unpatented lands in the State of California, within the land grant and indemnity land grant limits of the Central Pacific Railroad Company, as defined hy an act of Congress entitled, "An act to aid in the construction of a railroad and telegraph line from the Missouri river to the Pacific ocean, and to secure to the Government the use of the same for postal, military and other purposes," approved July first, eighteen hundred and sixty-two, and acts supplemental and amendatory thereof; and of the Western Pacific Railroad Company, as defined by an act of Congress entitled, "An act to amend an act entitled, 'An act to aid in the construction of a railroad and telegraph line from the Missouri river to the Pacific ocean, and to secure to the Government the use of the same for postal, military and other purposes,' approved July first, eighteen hundred and sixty-two, and to amend an act amendatory thereof, approved July second, eigbteen hundred and sixty-four," approved March third, eighteen hundred and sixty-five, and acts supplemental and amendatory thereof; and of the California and Oregon Railroad Company, as defined hy an act of Congress entitled, "An act granting lands to aid in the construction of a railroad and telegraph line from the Central Pacific Railroad, in California, to Portland, in Oregon," approved July twenty-fifth, eighteen hundred and sixty-six, and acts supplemental to and amendatory thereof; and of the Atlantic and Pacific Railroad Company, and of the Southern Pacific Railroad Company, as defined hy an act of Congress entitled, "An act granting lands to aid in the construction of a railroad and telegraph line from the States of Missouri and Arkansas to the Pacific coast," approved July twenty-seventh, eighteen hundred and sixty-six, and acts supplemental to and amendatory thereof; to he examined and classified by Commissioners to he appointed as hereinafter provided, with special reference to the mineral or non-mineral character of such lands, and to reject, cancel and disallow any and all claims or filings heretofore made, or which may hereafter he made, by or on hehalf of the said Central Pacific Railroad Company, or said Western Pacific Railroad Company, or said California and Oregon Railroad Company, or said Atlantic and Pacific Railroad Company, or said Southern Pacific Railroad Company, on any unpatented lands in said State of California, which upon examination shall he classified, as provided in this act, as mineral lands.

SEC. 2. That, for the purpose of making the examination herein provided for, there shall be appointed hy the President of the United States, as soon as practicahle after the passage of this act, three Commissioners, each of whom shall he a resident of the State of California, at least one of whom shall he a practical miner, and not more than two of whom shall he appointed from the same political party; and said persons so appointed shall constitute a Board of Commissioners to perform within such State the duties herein prescrihed. Before entering upon their duties each of said Commissioners shall take an oath to faithfully perform the duties of his office. The oath of office of said Commissioners shall be filed by them in the office of the Commissioner of the General Land Office. Said Commissioners shall receive for their compensation their actual traveling and other expenses incurred while in the performance of their official duties, and, in addition thereto, the further sum of ten dollars for each day they may he actually engaged in the performance of their duties; and their accounts shall be audited hy the Secretary of the Interior and paid monthly. Said Commissioners shall make examination of the lands herein mentioned, and may also take the testimony of witnesses as to the mineral or non-mineral character of any of said lands, and receive any other evidence relating to said matter, and shall have power to summon witnesses to appear hefore them, and to administer oaths; and they shall, immediately upon their appointment, proceed to examine and classify the lands herein mentioned, within said State of California, as provided in this act. All testimony taken hy said Commissioners shall be reduced to writing, subscrihed hy the witnesses, and filed with the report of the Commissioners hereafter required. The action or decisiou of a majority of said Commissioners shall control in all matters herein provided for.

SEC. 3. That all unpatented lands in said grants shall be classified and taken to he mineral lands under this act which have, or probably will bave, a market value by reason of the minerals which they contain, or which show such indications of deposits of valuahle minerals as would induce a miner to spend bis time or money upon tbem with the reasonahle expectation of finding mineral in paying quantities; or which, from their geological formation, or location in a well-defined mineral belt, or their situation or propinquity or relation to known mineral lands, are, or probahly will he, valuahle for the mineral therein; and all these matters shall be considered hy the Commissioners in determining the miueral or non-mineral character of such lands, and in classifying the same. The classification herein provided for shall he by sections, where tho land has heen surveyed, unless there are such differences in the situation or character of different parts of the same section as in the opinion of the Commissioners to require its classification by legal subdivisions. If the lands examined are not surveyed, classification shall he made hy tracts of such extent, and designated by such natural or artificial boundaries to identify them, as the Commissioners may determine. Where patents have heretofore issued for mining ground in any section of land, this shall he taken as *prima facie* evidence that the forty-acre subdivision within which it is located is mineral land; *provided*, that the word "mineral," where it occurs in this act, shall not be held to include iron or coal: *and provided, further*, that the examination and classification of lands herehy authorized shall he made without reference or regard to any previous examination or report or classification thereof.

SEC. 4. That such of the lands herein mentioned as have been surveyed prior to the passage of this act shall he first examined and classified as herein provided, and afterwards, and as speedily as practicahle, the lands herein mentioned which have not heen surveyed, until all the lands herein mentioned have heen examined and classified as herein provided.

SEC. 5. That said Commissioners shall, on or hefore the fifth day of each month, file in the office of the Register and Receiver of the Land Office of the land district, in which the land examined and classified is situated, a full report, in duplicate, in such form as the Secretary of the Interior may prescribe, showing all lands examined hy them during the preceding month, and specifying clearly, by legal subdivisions, where the land is surveyed, or otherwise, by natural objects or permanent monuments to identify the same, the lands classified hy them as mineral lands and those classified as non-mineral; and with said report shall he filed all testimony taken and written, communications received hy said Commissioners, relating to the lands embraced in the report. The Register and Receiver shall file one duplicate of said report in their office, together with all accompanying testimony and papers, and the other duplicate shall he, by them, forwarded direct to the Secretary of the Interior; and said Commissioners shall furnish to the Secretary of the Interior, at any time, such further or additional report or information as he may require, concerning any matters relating to their duties or the performance of the same. Upon receipt of such report, the Register of the Land Office shall, at the expense of the United States, cause to he published, in a newspaper of general circulatiou in each county in which the land so classified is located, at least once a week for four consecutive weeks, notice of the classification of lands as shown hy said report; and any person, corporation or company feeling aggrieved hy such classification may, at any time within sixty days after the first publication of said notice, file with the Register and Receiver of the Land Office a verified protest against the acceptance of said classification, which protest shall set forth in concise language the grounds of objection to the classification as to the particular land in said protest described, whereupon a hearing shall he ordered hy, and conducted before, the said Register and Receiver, under rules and regulations as nearly as practicahle in conformity with the rules and practice of such Land Office in contests involving the mineral or non-mineral character of land in other cases; and an appeal from the decision of the Register and Receiver shall he allowed to the Commissioner of the General Land Office and to the Secretary of the Interior, under such rules and regulations as the Secretary of the Interior may prescrihe; *provided*, that at such hearings the United States District Attorney, or his assistants for the judicial district in which the land is situated, shall appear and defend the interests of the United States, and for such services he shall receive compensation not exceeding fifteen dollars per day for each day's actual services before the Register and Receiver, to he paid out of the fund provided for the examination and classification of said mineral lands.

SEC. 6. That as to the lands against the classification whereof no protest shall have heen filed, as hereiubefore provided, the classification, when approved hy the Secretary of the Interior, shall be considered final, except iu case of fraud, and all plats and records of the local and general land offices shall be made to conform to such classification; and as to the lands against the classification whereof protests may he filed, the final ruling made after the day set for hearing shall determine the proper classification, and all records of the local and general land offices shall he made to conform to the classification as determined hy such final ruling, and all costs of such hearing shall he paid hy the unsuccessful party, under such rules as the Secretary of the Interior may prescrihe; and the Secretary of the Interior is herehy authorized to establish such rules and regulations as may he necessary to carry into

effect the true intent and provisions of this act as speedily as practicable.

SEC. 7. That no patent or other evidence of title shall be issued or delivered to said Central Pacific Railroad Company, or to said Western Pacific Railroad Company, or to said California and Oregon Railroad Company, or to said Atlantic and Pacific Railroad Company, or to said Southern Pacific Railroad Company, for any land in said State until the examination and classification provided for in this act shall have been made, and such patent or other evidence of title shall only issue then to such land, if any, in said State as any of said companies may be, by law and compliance therewith, and by the said classification, entitled to; and any patent, certificate or record of selection, or other evidence of title or right to possession of any land in said State, issued, entered or delivered to said Central Pacific Railroad Company, or to said Western Pacific Railroad Company, or to said California and Oregon Railroad Company, or to said Atlantic and Pacific Railroad Company, or to said Southern Pacific Railroad Company, in violation of the provisions of this act, shall be void; *provided*, that nothing contained in this act shall be taken or construed as recognizing or confirming any grant of land or the right to any land in the said Central Pacific Railroad Company, or in the said Western Pacific Railroad Company, or in the said California and Oregon Railroad Company, or in the said Atlantic and Pacific Railroad Company, or in the said Southern Pacific Railroad Company, or as waiving or in any wise affecting any right on the part of the United States against the said Central Pacific Railroad Company, or the said Western Pacific Railroad Company, or the said California and Oregon Railroad Company, or the said Atlantic and Pacific Railroad Company, or the said Southern Pacific Railroad Company, to claim a forfeiture of any land grant heretofore made to any of said companies.

SEC. 8. That there is hereby appropriated, out of any money in the treasury not otherwise appropriated, the sum of twenty thousand dollars, or so much thereof as may be necessary, to be expended to carry into effect the provisions of this act, the same to be paid out upon the order of the Secretary of the Interior; and the Secretary of the Interior is hereby required to embrace, in the annual estimates submitted to Congress for appropriations for the Interior Department, a sufficient sum to pay the said Commissioners for the fiscal year next ensuing, and annually thereafter until the classification of lands required by this act has been fully accomplished.

The "Compromise" bill adopted by the Executive Committee is a very different affair. Here are its provisions:

AN ACT TO PROVIDE FOR ASCERTAINING AND DETERMINING THE CHARACTER OF CERTAIN LANDS IN THE STATE OF CALIFORNIA.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

SECTION 1. That the Secretary of the Interior be, and he hereby is, authorized and directed, as speedily as practicable, to ascertain and determine the character, whether mineral or non-mineral, of all the surveyed odd-numbered sections of unpatented land in California lying within the primary and indemnity limits of the grants made by Congress on July 1, 1862, and July 2, 1864, to the Central Pacific Railroad Company of California, and the Western Pacific Railroad Company; on July 25, 1866, to the California and Oregon Railroad Company; and on July 27, 1866, and March 3, 1871, to the Southern Pacific Railroad Company, in the manner hereinafter provided; and as rapidly as the unsurveyed lands within the limits above designated are surveyed, in accordance with the law governing the United States public land surveys, the character, whether mineral or non-mineral, of the odd-numbered sections thereof shall, in like manner, be ascertained and determined.

SEC. 2. As soon as practicable the Secretary of the Interior shall publish a notice containing a list of all the surveyed lands hereinbefore mentioned, described by legal subdivisions, and informing all persons that they may, within thirty days after the completion of the publication of such notice, file with the Register and Receiver of the land district, wherein such land may be situated, a protest against the patenting of any of such land to the Railroad Company within the limits of whose grant such land may be; and a similar notice shall thereafter, and in like manner, be published with reference to the unsurveyed lands in the preceding section described as rapidly as the same shall have been surveyed, in accordance with the law governing the United States public land surveys.

Said notice shall be published at least once a week for a period of sixty days in some newspaper of general circulation, to be designated by the Secretary of the Interior, in each county wherein are situated any of the lands above mentioned; but such notice need not be published in any county wherein there is not published a newspaper of general circulation. Such notice shall also, during said period of publication, be posted in a conspicuous place in the land office for each land district wherein any of such lands are situated.

SEC. 3. During the period of such publication of said notice, or within thirty days thereafter, any person may file with the Register and Receiver a verified protest against the patenting of any of the lands described therein, which protest must particularly describe the lands protested, by sections, or by legal subdivisions thereof, and must set forth the nature and extent of the lands known or believed to be valuable for the mineral therein contained, and must fully set forth in detail the facts upon which such knowledge or belief is founded, together with the names and postoffice addresses of any persons claiming or interested in such mineral lands, if known to the contestant.

SEC. 4. That, at the expiration of the period above limited for the filing of protests, the Register and Receiver shall forward duly certified copies of all protests filed to the Secretary of the Interior, who shall thereupon suspend the issuance of patents as to all lands against which protests have been filed in time, manner and substance as in the last preceding section provided; and no lands so suspended shall be patented to any railroad company until, if at all, after the non-mineral character thereof shall have been established by a preponderance of proof in the manner hereinafter provided.

SEC. 5. As soon as practicable after receiving such protests, the Secretary of the Interior shall cause hearings to be held before the Registers and Receivers of the proper local land offices as to the mineral or non-mineral character of all the lands as to which the issuance of patents has been suspended in accordance with section four of this Act. Notice of such hearings shall be served on each protestant, and shall also be published at least once a week for four successive weeks in some newspaper of general circulation, to be designated by the Secretary of the Interior, in each county wherein are situated any of the lands affected by such notice; but such notice need not be published in any county wherein there is not published a newspaper of general circulation. Such notice shall also, during the period of its publication, be posted in a conspicuous place in the land office wherein such hearing is to be had.

For the purpose of facilitating the hearings herein provided for, the President of the United States shall appoint an attorney, residing in the land district in which the hearing is to be had, to appear and maintain the mineral character of all the lands subject of the hearing; and all final decisions, rendered in pursuance of such hearings, shall be forever conclusive, except in cases of fraud. And the President of the United States shall also appoint three commissioners in each land district in which any lands covered by such protests are situated, each of whom shall be a resident of the State of California, and at least one of whom shall be a practical miner, whose duty it shall be to inspect all the lands about which hearings are ordered, and to testify as witnesses to all the facts which they have ascertained respecting the mineral or non-mineral character of the lands which they have examined; and such commissioners may also procure the attendance of other persons as witnesses at such hearings, and may introduce any other competent evidence as to the character of the lands on trial. Before entering upon their duties, each of said commissioners shall take and subscribe an oath to faithfully perform the duties of his office, which oath shall be filed with the Commissioner of the General Land Office.

That at such hearings evidence may be introduced by any person interested to show that any of such lands have, or probably will have, a market value by reason of the minerals which they contain; or that they show such indications of deposits of valuable minerals as would induce a miner to spend his time or money upon them with the reasonable expectation of finding mineral in paying quantities; or that such lands, from their geological formation, or location in a well-defined mineral belt, or their situation or propinquity or relation to known mineral lands, are, or probably will be, valuable for the minerals therein; and all these matters shall be considered in determining the mineral or non-mineral character of such lands, and in classifying the same. The classification herein provided for shall be by sections, unless there are such differences in the situation or character of different parts of the same section as require its classification by legal subdivisions thereof.

Where patents have heretofore issued for mining ground in any section of land, this shall be taken as *prima facie* evidence that the forty-acre subdivision within which it is located is mineral land; *provided*, that the word "mineral," where it occurs in this act, shall not be held to include iron or coal; *and provided, further*, that the classification of lands hereby authorized shall not be controlled by any previous examination or report or classification thereof; *and provided, also*, that appeals shall be allowed from the decisions of the Register and Receiver to the Commissioner of the General Land Office, and to the Secretary of the Interior, under such rules and regulations as the Secretary of the Interior may prescribe.

SEC. 6. That each of said Commissioners shall receive his traveling expenses and ten dollars for each day he is actually engaged in the performance of his duties, and the accounts of said Commissioners shall be audited by the Secretary of the Interior, and paid monthly; and each attorney so appointed by the President of the United States shall receive his reasonable traveling expenses from his place of residence to the United States Land Office, which he is required to attend, and return, and fifteen dollars for each day he is actually engaged in the performance of his duties, and his accounts shall be audited by the Secretary of the Interior, and paid monthly.

And it is further provided that all publications herein provided for, and the cost of reporting the testimony given and evidence presented by the said Commissioners, and the *per diem* and expenses of the Commissioners and Attorneys, shall be paid out of the fund hereinafter provided for.

SEC. 7. That there is hereby appropriated out of any money in the Treasury not otherwise appropriated the sum of twenty thousand dollars, or so much thereof as may be necessary, to be expended to carry into effect the provisions of this act, the same to be paid out upon the order of the Secretary of the Interior; and the Secretary of the Interior is hereby required to embrace in the annual estimates submitted to Congress, for appropriations for the Interior Department, a sufficient sum to pay the said Commissioners, Attorneys and expenses for the fiscal year next ensuing, and annually thereafter until the classification of lands required by this act has been fully accomplished.

There are two radical defects in this last bill which will prevent it from ever being of any practical benefit to the mining interest.

The first is seen in Section 2, which substantially provides that a list of all the railroad lands must be published at once and that no protest will be considered unless filed within three months from the date of the first publication. This means that the whole vast area must be critically examined by agents of the Miners' Association within three months—something manifestly impossible.

Inasmuch as the Miners' Association has no organization nor funds for such a purpose, it is at least remarkable that any representative of the miners should consent to such an arrangement. It would seem that the railroad people are trying to make use of the Miners' Association to further a grab, which the miners would be simply helpless to oppose.

The second defect is shown in Sections 3 and 4, which must be read in the light of the decision of Secretary Smith on the Benjamin protests in order to be fully understood.

Section 3 provides that a "protest must particularly describe the land protested by sections, or legal subdivisions thereof, and must set forth the nature and exteut of the land known or believed to be valuable for the mineral therein contained; and must fully set forth in detail the facts upon which such knowledge or belief is founded, etc." Section 4 should alone prevent the passage of the bill, viewed from the standpoint of the miner. To go into detail on this point is probably unnecessary to those who can understand it and useless to those who can not.

Section 4 provides that upon receipt of such protest the issuance of patents shall be suspended "as to all lands against which protests have been filed in time, manner and substance as in the last preceding section provided." It cannot be ascertained, by the closest investigation of Sections 3 and 4, what matter of "substance" must be considered sufficient by the Secretary for the allowance of a protest. And as the bill furnishes no new rule, there can be no question that the Secretary will continue to follow the rules of July 9, 1894, and his former interpretations thereof. These interpretations are in effect that general protests will not be received, no protest being allowed excepting in cases of individual claimants after a mineral discovery.

The whole purpose of this mineral lands agitation is thus set at naught.

There can be no question in the minds of those who have watched the course of proceedings that, should the bill pass, the whole batch of general protests which might be filed under its provisions would be swept aside by an omnibus decision which would leave the lands free from obstruction to patent by the railroad.

If anything could be more satisfactory to the corporations, it is hard to conceive what it might be.

In October, '94, this journal pointed out the evil effects to the mining industry of this State of the procedure adopted by the Secretary of the Interior and the probable corporate absorption of much of the mineral area of the State unless the manifest move was checked. The Miners' Convention the next month took the matter up and created a special committee which vigorously opposed such encroachment and checked the swift and silent absorption that had begun. The question received the widest attention; it was personally brought to the cognizance of every public official including the President of the United States, and each promised to see that justice was done. Journals here and elsewhere susceptible to corporate influence attacked the movement, its motives and, at last, under evident instruction assailed the mining industry of the State. Difference of opinion arose in the Executive Committee, but public opinion was so manifestly imbued with a correct understanding of the matter that any attempt to subdue or sidetrack the movement was unavailing. In the recent convention the committee's work was endorsed and unanimously ordered continued.

Justice to itself and to the cause it represents impels this journal to protest against the passage "in the name of the miners of California" of the bill adopted by the Executive Committee on the 12th inst.

It has been said, "Well, if we can't get all we want, let us take what we can get." Read the last bill, printed on this page, and see what the miners "get:" nothing. It is a travesty on justice; it is a good Southern Pacific bill, but it will not keep one acre of California's mineral area from the hands of those who seek to acquire it unjustly. It is not pleasant to be obliged to say this, but it is the truth. We impugn no one's motives; doubtless the gentlemen who framed this measure, and who voted for its adoption, believed sincerely it is the best that could be done, and in the only shape possible of passage, but better pass no bill at all than for the miners of California, in or out of convention, to stultify themselves by endorsing a piece of proposed legislation that defeats the very object it ostensibly is meant to secure.

W. V. TOMKINS, of Prescott, Ark., William Harrison, Georgetown, Ga., and F. M. Leonard, Libby, Mont., are the members of the mineral land commission for the Missoula district of Montana. They report that they have inspected and passed upon 303,270 acres of land this season. Gentlemen in and out of the Executive Committee of the California Miners' Association who are told that the labors of the commission have been "unsatisfactory" might, possibly, modify that opinion by reading the report or communicating with either of the above-named commissioners.

THE Northern Pacific Railroad Co has announced that it will make no more opposition to any Montana mineral land protests where the protested sections include bona fide mining property. This will no doubt be a surprise to the gentlemen in California who assure us that the Montana mineral land act, which has been in operation in that State during the year is a failure and unsatisfactory. It has accomplished its object to retain the unpatented mineral area of Montana to the miner. As to its being "unsatisfactory," so much depends upon the point of view.

Notes on Gold Milling in California.

NUMBER VI.

By E. B. PRESTON, M. E., Field Assistant State Mining Bureau.*

The Discharge is next arranged. This is the distance between the top of the new dies and the lower edge of the screen, and to fix the right distance is of importance. The greater the height of the discharge, the greater will be the proportionate amount of pulp and slime, and they also will be retained longer in the mortar. The quantity of amalgam retained in the mortar is also proportionately greater. A low discharge calls for a coarser screen, and naturally results in a larger output of the battery, and with a larger proportion of outside plate amalgam. With a *constant* height of the screen, the natural wear of the die increases the height of the discharge. For ordinary iron shoes and dies, and average rock, the wear of the die is roughly estimated from ¾ to 1 lb. of iron per ton of ore crushed. To counteract the effect of this wear on the discharge height, different sized chock-blocks or screen-frames are supplied; the highest being used with new dies, and later replaced by lower ones, thus holding the distance more even than the use of a single size would permit. In some mills, when the dies are worn down, an iron plate, made for the purpose, is laid beneath them to raise them up.

As a very high discharge, besides creating much slime, beats up a larger portion of the gold into float gold than would be the case with low discharge, the choice necessarily influences the gold recovery; this is more particularly the case, if the ore carries any appreciable amount of valuable sulphurets. The discharge varies in the different mills from 4 inches to 10 inches, the average being from 6 inches to 7 inches.

Screens.—In fastening the screen to the screen-frame, care must be observed to get it on smooth, without any wrinkling or buckling. Tin screens must have the tin burned off before fastening to the frame; it is also well to expose the Russian-iron screens to a quick fire of shavings, to burn off the oil with which they are more or less faced. The edges of the screen are tacked to the frames, and are faced with strips of blanket to make a close connection with the mortar. In fastening a wire-cloth screen, to get it on smooth, a good method is to tack it first along the lower edge, then draw it up tight and even over the upper edge, and nail it before cutting if off the roll. As previously stated, brass-wire screens should not be used in conjunction with cyanide of potassium, as the brass becomes coated and clogged with amalgam. The screen-frame with screen is dropped into the grooves cast on the outside of the mortar discharge, and fastened solid with iron wedges—two vertical (one for each groove) and a horizontal one in the center of the lower lip. The wedges should have a broad head, to facilitate knocking them out. After the screen has been fastened in place, a piece of canvas or a board should be hung in front to arrest the outward throw of the pulp from the drop of the stamp, and direct it in an even flow onto the plates beneath. In some mills this board is giving a slope towards the screen, and has an amalgamated plate screwed on, which receives the splash. Bolted to the front of the modern mortars is a frame to carry the outside battery-plate and a distributing-box, a few inches above the apron-table on which it discharges.

When everything is ready to drop the stamps, the self-feeder is rolled to its place, the cam-shaft is set to revolving slowly, the water is turned into the battery, and the millman, standing on the platform above, grasps the hand-hold of the first finger or prop and introduces, with the other hand, the cam-stick between the tappet and the revolving cam; by this means the weight of the stamp is taken off the prop, which is pulled back and rested against the edge of the platform. This operation is repeated with each stamp until all are working. To carry out this operation when the shaft is revolving rapidly, without injuring the operator's hands, requires practice. The cam-stick mentioned above consists of a peice of wood about 2½ feet long, 1 inch thick at the point, running up to 2½ inches near the handle, and faced with strap-iron or a strip of belting. It may also be made entirely of strips of belting, 2 inches or 3 inches wide nailed over each other and attached to a wooden handle. To hang up the stamps, the hand-hold is grasped, the knee pressed to the latch-finger, and the cam-stick introduced between cam and tappet as before, and the latch-finger pushed under the tappet.

Before dropping the stems the face of the cams should be tightly lubricated, for which purpose axle grease or specially prepared compounds are used; a very useful one is a mixture of graphite and molasses; in some mills, to avoide the use of grease, the face of the cam is rubbed with a bar of common soap.

Grease.—It being essential, for good amalgamation, that the presence of grease be avoided in the battery, care must be observed in lubricating the cams, the stems where passing through the guides, and the shaft bearings. In many mills, trays made from old oil-cans are fastened beneath the bearings, cloth aprons are tacked from the underside of the guides to the floor above; rings of rubber packing or old belting also encircle the stems at the lower edges of the guides. The millman should diligently wipe off the stems and any part of the battery frame, where the presence of grease is indicated, at least once during a shift. Grease in the mortar is indicated by a black, dirty appearance of the surface of the plates, as also by the adhesion of more than the usual proportion of the amalgam to the iron castings inside the mortar. The usual remedy is to shut off a part of the battery water, for a short time, while adding a lye solution; or to add fine wood ashes to the ore.

The Amount of Water Required for the proper working of the battery depends on the nature of the ore; clayey ores, or such as have a high percentage of sulphurets, requiring the most; but while in the former case a greater amount is needed inside the mortar, the latter condition permits a part being added outside the screen, on the lip of the mortar. A small sluice-box, with plug-holes, is placed across the front in this case, or the water is conveyed by means of a half-inch perforated iron pipe, attached to the vertical supply pipe by an elbow joint, permitting it to be turned either way as required. "The amount of water used per ton of ore stamped varies from 1,000 to 2,400 gallons, with a mean amount of about 1,800 gallons per ton of rock crushed." Most of the mills in actual practice figure roughly on one miner's inch of water, more or less, per twenty-four hours for each battery of five stamps. To obtain the largest amount of crushing of clean quartz from a battery, only sufficient water should be used inside to keep up the regular, even swash of the pulp, and if that be not sufficient to keep the plates on the outside clear from accumulating pulp, more may be added outside the screen. The pulp, in passing down over the apron-plate, should roll in successive waves, corresponding to the back and forth wave-motion inside the battery, rather than flow in an even sheet, as affording a better opportunity of contact for the particles of amalgam.

Where the temperature falls low in winter, arrangements should be made to deliver the water in a tepid condition, as better amalgamating results will be obtained, through keeping the quicksilver in a lively condition. Where steam power is used, this can be easily arranged; but when using water power, a separate heater is required.

Feeding.—Hand-feeding has become nearly obsolete in California. It is only practiced in small concerns; or where a temporary mill has been put up for prospecting purposes. The advantages of a machine-fed mill are numerous; the chief of these are (1) that the wear of the iron of the shoes and dies is less and more even-faced; (2) that from 15% to 20% more ore can be crushed in a given time; and (3) that the labor expenses are reduced. The machines should be carefully gauged and watched to insure a steady, low feeding of the stamps. In order to insure a good splash in the mortar attention must be given to the succession in which the stamps are made to drop. A good splash is one that shows a wave passing along the lower edge of the screen, moving backward and forward from end to end, or a similar wave-motion that has its initial point from the center stamp. The succession most frequently adopted in California is 3, 5, 1, 4, 2; 1, 5, 2, 4, 3; 1, 3, 5, 2, 4, and 1, 4, 2, 5, 3; the last spreads the pulp very evenly from end to end. The greatest amount of discharge is obtained, apparently, by dropping the center stamp first; while the most crushing is done, other conditions being equal, by dropping the end ones first. Any arrangement of the stamps will answer, however, that distributes the pulp evenly and discharges it well.

The Apron should be set immediately in front of the mortar, but independent of the battery-frame, to exempt it from the jar of the stamps; it should be arranged to permit of the grade being easily altered if necessary. The size, shape, and grade of the apron-plates differ widely, depending largely on the the millman's preferences and experience. The usual form of the apron is rectangular, of the width of the discharge, and any length desired, but usually from four feet to twelve feet, forming a level (transversely), smooth surface, set on a grade varying from one-half inch to two and one-half inches to the foot. Sometimes the surface is divided by steps, with or without distributing-boxes. These are usually from one inch to two inches. The apron should never be drawn in at the lower end, for reasons given further on; and the steps should not be too deep, as otherwise the plate next to the drop will show mostly bare copper through scouring.

On examining a plate that is in use under good working conditions, it will appear that the upper portion, immediately below the mortar, say for a distance of eighteen inches, carries at least 75% of all the amalgam caught on the apron, the largest accumulation showing along the line of impingement next the lip of the mortar. Now if the apron-plate were discontinued at about two feet, and continued again on a lower level of about two inches, a second line of accumulation would result, naturally on a smaller scale; hence, the advantage of the step form. Another advantage in this style of apron, if that by fastening these sections to the table by means of wooden buttons on the sides instead of cleats and screws, and having one extra plate on hand, the scraping and dressing of the same can be performed at any time, without stopping the crushing of the stamps, by removing the plate and substituting the extra one.

The grade of the apron-plate should be such as to keep the surface clear from any pulp accumulations, but not steep enough to obtain a scouring action. It will depend on the coarseness of the pulp, the nature of the gold, the amount of water available, and the percentage and nature of the sulphurets. Where a battery-plate is in use above the apron, it is usually given a grade of from one and one-half inches to two inches to the foot. Grades for the apron proper vary from one-half inch to two and one-half inches to the foot, but the average is about one and one-fourth. The apron-plates are usually silver-plated copper plates, which have largely superseded the copper amalgamated plate of former days—chiefly on account of the readiness with which the former plates do their full duty from the first starting, which is not the case with the copper plate; also, on account of their freedom from discoloration by oxidation. If silvered plates be used when running a very low-grade ore, the plating soon wears off, requiring a replating about every six months. The usual amount of silver put on plates is one ounce to the square foot. The usual thickness of copper plates is one-sixteenth inch to one-eighth inch. In preparing them for amalgamation they should first be carefully heated to a black heat, and plunged into cold water, which makes them soft and more ready to take up quicksilver. They are then scoured bright with fine tailings-sand, moistened with some cyanide of potassium and applied with a block of wood; then dressed all over with a weak solution of nitric acid, or with cyanide of potassium and quicksilver, with sodium amalgam sprinkled over and brushed or rubbed into the surface. Before final use, it is well to give them a coating of fine gold amalgam; or, if not convenient, silver amalgam will answer. In using the cyanide of potassium solution, care must be taken not to use it too strong, especially if the quicksilver is not applied to the plate immediately, otherwise a coating is formed on the surface that will not take up the quicksilver. Where the ore is of a fair grade, after a long period of continuous use the plate will have absorbed an amount of gold that will not yield to scraping unless the plate is immersed in boiling water for a time before being scraped, or heated over a fire and hammered with a mallet on the reverse side, in which case care must be taken not to dent the plate.

As the saving of amalgam on the apron and sluice-plates is largely a matter of gravity, the conditions under which the pulp passes over the plates should conform to the laws pertaining to the falling of a body through a moving liquid medium; hence the proper shape of the apron, and the flow and consistency of the pulp, should be well considered. If, as was formerly the almost universal custom, the lower end of the apron be contracted (and in numerous cases this contraction was as great as four to one), the depth of the pulp spread over the surface of the plate increases as it passes down; the flow of the water across a given section becomes uneven, forming at the sides a swirl, along the edge of which, sand is precipitated, covering and rendering that portion of the plate useless, from its inability to come in contact with the particles of amalgam, while producing scouring currents at other parts. The proper method is to spread the flow over a wider surface as it passes from one plate to the other, and lessen the grade, which may require an addition of clear water.

This contraction of the plates is made to this day in most of the mills, when connecting with the sluice-plates. The liquid pulp, starting with a width equal to that of the mortar-discharge, is made to pass over sluice-plates from one foot to two and one-half feet in width; hence, the comparatively small percentage of amalgam obtained from them. The only condition under which narrow plates are permissible, is where, previous to receiving the pulp, a certain amount of the solid matter has been diverted. Where all the pulp goes from the plates to concentrators, the latter become an important factor in regulating the amount of water turned into the battery. The feed-water required for concentrators of the vanner types is from one to two gallons per minute.

(*To be Continued.*)

* Bulletin No. 6, California State Mining Bureau.

A NEW METHOD of manufacturing illuminating gas from coal dust consists in allowing the coal to enter in a continuous stream a retort heated from the outside, by means of feeding apparatus in the top of the retort.

Notes on Certain Water-Worn Vein Specimens.*

By F. C. HOLMAN, San Francisco, Cal.

It is desired in these notes to record a vein phenomenon certainly unique in the writer's limited experience, and, as it seems to him, sufficiently rare to be worthy of mention.

In the little mining camp of Forhestown, situated in the Sierra Nevada of California, it was announced one day, when the miners of the Gold Banks mine came off shift, that "washed gravel" had been struck on the 265-foot level. To those acquainted with that section and the character of the mine (a gold-bearing quartz vein) this was a somewhat startling announcement; for, prolific as the State is, we are not in the habit of mixing up promiscuously our vein and placer deposits. However, the statement proved to have some foundation.

The mine is located at an altitude of about 2700 feet, on the brink of one of the great canyons of erosion characteristic of the drainage of this range. A lateral ravine cuts the vein at right angles, thus making its general strike approximately parallel to the canyon at this point, and with a variable dip of from 20 to 40 degrees towards the canyon. The strong, well-defined vein, often twenty feet wide and more, presents nothing to distinguish it particularly from scores of others in the State, unless it be considered peculiar in the highly crystalline character of its quartz and the nature of the enclosing country rock, which is metamorphic in the extreme, very hard, devoid of lamination, and in bedding so obscure that it might easily pass—at least on superficial examination—for one of the basic eruptives. Near by in the district can be found a series of slates common to the gold belt of this range, and within the limit of the company's property is an intrusion of an acid eruptive. On an adjoining claim a granite shows itself. The mine is opened through an inclined shaft sunk on the vein. The ore carries both free gold and sulphurets, the greater part of its value being in the latter. For a California gold ore, the amount of silver is unusually high. The vein being very compact and the quartz highly crystalline, the mining of the ore is by no means easy. Except at the immediate surface, no oxidized ore is found. Vugs are numerous, furnishing large and perfect crystals, and it is with one of these cavities that we have to deal.

It was opened into on the roof and side of the 265-foot level; irregular, chimney-like and of such size—running upwards on the dip of the vein for a rod or more—as to permit one easily to crawl into it. It gradually closed in at both ends. Unfortunately, the work going on in this part of the mine made it impracticable for a visitor to trace the continuation of this cavity (if any existed) in either direction, or to form a more thorough idea of its immediate surroundings. The foreman said it could be traced to the level above, 100 feet.

As far as it was possible to judge, the vein at this point was in its original condition, with solid quartz on all sides of the vug, and no evidence that the vein had been fissured or broken up by any movement of the walls since the deposition of the quartz. There was no water coming in on this level and very little on the level above.

The sides and roof of this cavity were beautifully studded with crystals, many of them large and perfect, while on the inclined bottom was a mass of loose quartz debris. Generally scattered over the bottom, the deposit increased in quantity towards the lower end. It comprised both amorphous and crystalline material, single broken crystals and clusters. While most of this material was rather fine, the majority of the pieces being under three inches on any dimension, coarser stuff was mixed with it, some of the latter masses, which had evidently fallen from the roof or sides, being slab-like in their proportions and suggestive of a crustified deposit in process of formation.

While the loose stuff furnished plenty of pieces not defaced further than by simple fracture, a large proportion of it showed evidences of attrition in all degrees, from the crystal with only the apex and edges slightly smoothed off to the rounded, translucent pebble, such as any water course or sea beach might produce. Admitting a preliminary fracturing, a close examination of the specimens leaves little room to believe that any other agency than that of mechanical abrasion in a stream of water will account for their later reduced condition. The wearing down of the most obtrusive points and the corresponding protection which others, less exposed, have received; the irregular effect in the same specimen of a rough grinding here and a polishing there; the accumulation of fine quartz particles and dust in the cavities among the crystals; these alone, without other considerations, would seem to establish sufficiently the fact of this agency.

There has been a current of water during the formation of this ore body that in its velocity departed very materially from the slow percolation usually associated with the genesis of ore deposits of this kind. To which of several causes the fracturing is to be ascribed is not so evident. It looks as if the violent action of the water might be responsible for some of it. If not wholly due to this cause, the balance must be charged to the account of a movement in the walls of the fissure, or to gravity acting in the simple form of masses falling from the roof, a few feet to the floor, but not through the buoyant medium of water. Besides the crystals that have been both broken and eroded, many showed no signs of the latter effect, and while some of these might have been recently broken in mining, the evidence of fracturing by natural causes is both too apparent and abundant to allow this possible human agency to have any bearing of importance. One, at least, of the main factors in reducing some of these masses to their present size must have been coarse material rubbing upon itself; and the force of the stream that could perform the work of moving some of the larger pieces, the entire superficial areas of which have suffered by erosion, must have been considerable. Nor could the appearance of these specimens be the result of a long-continued impact of fine material, acting on the principle of the sand blast.

Take, for example, a translucent specimen weighing nineteen and one-half ounces avoirdupois, of an approximate elliptical section, five and one-half inches long, three inches wide and one and one-half inches at its greatest thickness. From its original form it must have lost, at a low estimate, at least its present weight. Its present rather smooth surface has outlined upon it the bases of numerous large crystals, irregular hexagonal polygons and other cross sections depending upon the positions occupied by the crystals. While smooth, it is not polished, excepting an occasional small facet-like face where a body in contact by long-continued action has reduced the rougher surface. Such little areas are distinguishable from unaltered portions of crystal surfaces. Most of the crystals have been left with a rough surface; but in others polishing has followed, producing the appearance which a clear crystal has when its edges have been rounded off by solution.

Iron and copper pyrites in small crystals are found in the specimens, and partake of the same general effects as their harder surrounding matrix.

Equally interesting with the fact of attrition is that of deposition as displayed in a very thin coating of iron sulphide upon the eroded surfaces. As a coating, it is too minutely crystallized to allow its form to be made out under an ordinary glass; but it has in appearance nothing in common with the older and coarser deposition of iron pyrites, contemporaneous with the quartz. Very firmly attached, it is present on all of the larger specimens in patches, and must have been widely deposited in the chamber upon the debris; and its absence on parts of these same pieces can clearly be ascribed to erosion, all the phases of which are as plainly shown on this metallic coating as upon the underlying eroded quartz surface.

Here, then, in a large fissure vein, along one of the closing channels of its formation through which circulated waters carrying the vein-forming material—quartz and its accompanying sulphides—mechanical work has been performed by a current under sufficient intensity of pressure to grind quartz upon itself. The solid worn masses and the diminution in their size, and in the size of large crystals (particularly such as are imbedded and exposed along the plane of the major axis, so that they could have lost but little, if any, by fracturing) tend, with other details, to show a prolonged action or a violent one, or some combination of the two. It is hard to conceive of a current horn of the deep circulation as responsible for this case. Yet if the erosion is a phenomenon of the vadose circulation, as seems probable, so also is the secondary deposit of sulphide, and we are forced to accept somewhat peculiar attending conditions to account for it. It would be a case of mineralization by the two circulations at the same point, a considerable distance below the surface; the metallic sulphides being drawn from two distinct sources of supply, far removed from each other. Except in limestone regions and certain other formations, a stream pouring directly into a fissure depositing and eroding alternately is not commonly displayed in the shallow circulation. Furthermore, the erosion was not chemical, but mechanical.

Other accessories to the fact must be allowed: an oscillation in the stream to permit two such antagonistic forces to act; a sufficient supply of organic matter to reduce the oxidized products of other veins, carried in solution; an open channel and free exit somewhere for such a volume of water. The present topography of the country on the strike of the vein does not suggest that any such opening, offering the required difference in level, existed; and it would be necessary to look for an outlet in a cross fissure at right angles leading into the present drainage.

Such an assumption will, of course, require, for the age of this erosion and secondary deposition of mineral, a very late geological date, subsequent to the cutting down of the country and the formation of the canyon and its drainage system.

* Read at the Atlanta meeting of the American Institute of Mining Engineers, October, 1895.

Ancient Quartz Mining.

Written for the MINING AND SCIENTIFIC PRESS by I. B. STORCH, M. E.

The time of the discovery of gold is unknown, but manufacturing of gold jewelry can be traced by the oldest historical records, even back to biblical traditions. The oldest gold mines worked by people, of which no history, no traditions exist, great mines, the ruins of which were discovered by the explorer, Manch, in 1871, are situated near the ruins of Zimbabye, South Africa, believed to be the famous Ophir of King Solomon. These gold mines are undoubtedly the oldest known to the memory of man.

The first memorandum about gold mining has been discovered among the papers of the Grecian writer, Diodorus, 400 before Christ: "On the boundary line of Egypt there are certain dominions, full of developed gold mines, being worked by a large number of people deported there by the kings of Egypt," etc.

The first authentic description of mining for gold by the ancient Egyptians and Nubians was published by the Grecian historian, Agatharchides, 200 before Christ, stating that the auriferous rock underground is loosened by fire, and then broken by hand into smaller pieces, finally stamped, washed and smelted.

Mining was conducted by an experienced miner, who prospected the ground, and when a gold cropping was found, set the men at work, who simply had to follow the irregular course and the threads of the ore as long as it lasted; no deadwork was done, and as soon as the ore was dug out the hole was deserted and work was commenced on a new discovery.

The different kinds of work were divided among the laborers according to intelligence, age and strength; professional skill was not wanted, except for washing the pulp. The laborers were recruited from notorious criminals, prisoners of war, their families and even their descendants, all were claimed, and had to work day and night, twenty hours out of twenty-four, being watched by soldiers, foreigners who spoke another language, so that understanding and conversation among them was impossible. No care was taken of them; if well or sick or crippled they were driven to work like a band of cattle, cursed and cruelly beaten by their overseers, until they broke down. Men of best age and full power were placed underground, to break down the ore, sink inclines, etc. They had a light fastened on their forehead, and their only tool was a kind of sledge. Children of both sexes packed the ore to the surface, and there it was received and transported by feeble old men to the stamp mill, and stamped to small gravel size by selected men of thirty years of age. A ram of deep mortar holes cut into the rock wall near the mouth of the mine replaced the battery of present times, and the rock was stamped by hand with light iron stamps. Small grinding mills were erected at the nearest creek or brook, and the grinding stones were turned by hand. Only women were employed to grind the hard quartz to fine pulp, and the writer says: "It was the most pitiful sight—the poor creatures, half-starved, naked skeletons, enveloped in a thick cloud of poisonous dust; death was preferable to their miserable life."

The pulp was then spread on tables, a little inclined, and by skillful hands washed, so that the heavier gold separated from the lighter gangue. The finishing touch was performed with soft sponges, by dotting out the last particles of sand. The gold was then gathered and melted in clay crucibles. The smelter used for fluxing lead, salt, a little tin, and bran, and it took five days and nights heavy and continuous firing to get the bullion.

This mode of mining was conducted for nearly 2000 years, with hardly any improvements. Amalgamation was found in operation first in South America in 1557.

THE screw-thread on railroad track bolts is usually cut by forcing them into a die or matrix and rotating them slowly. The method greatly weakens the metal. A Pittsburg concern is now making the thread by pressure only, the bolt remaining cold during the operation. By this method the threaded portion of a bolt having a ¾-inch shank is given a diameter of 13-16. The blank part of this bolt will break, it is claimed, before the threaded portion.

A BIG concern in Waterbury, Conn., now makes buttons consisting of a thin aluminum shell filled with plaster of Paris.

Concentrates.

PECK BROS.' new mill at Empire, Nevada, is completed.

A SEVEN-FOOT VEIN of $20 ore is reported on the 200 level of the Bodie.

THE Alaska-Treadwell Company talks of putting in a pneumatic locomotive.

VICTOR, COLO., with 2000 people, has two daily newspapers and a stock exchange.

THE Silver Peak, Nevada, leaching works are reported shut down for lack of cyanide.

SEVENTY-FIVE BARRELS of whiskey await transportation at Hawthorne, Nev., to Bodie, Cal.

EIGHT MILLION DOLLARS is the estimated gold output of Cripple Creek, Colo., district for 1895.

IT is stated that if anything is a failure so far at Kennedy, Nev., it is not the mines themselves.

SOUTHERN OREGON miners purpose meeting at Grant's Pass, January 6, 1896, to form a miners' association.

BASIN, Mont., people expect to hear next week of the sale of the Hope mine to New York men for $900,000.

A TRAIL CREEK, B. C., man writes: "Locating claims has now been succeeded by considerable development work."

A CHECK in favor of J. Ryan, drawn by Mountain Mines Co., on the Bank of Shasta, awaits ownership in this office.

DR. LATHAM of this city and J. C. Conklin of Salt Lake have bonded twelve claims three miles west of Mercur, Utah.

THE Johanneshurg, South Africa, *Star* says "the retailer of water at six pence per bucket is doing splendid business."

THE Cripple Creek, Colorado, *Mail* of the 14th inst. contains applications for U. S. patents for 148 different mining locations.

LAST week's rains have enabled several Sierra foothill mines to resume work, and miners and farmers are alike happy.

THE November output of the Seven Thirty mine at Georgetown, Col., was over 20,000 ounces of silver and 27,000 pounds of lead.

ON the 30th inst. the Horn Silver mine will pay a $50,000 dividend, the first since last March, making a total to date of $5,080,000.

SHASTA now talks of electric lights, the power and illumination to come from the Iron Mountain smelter, located two miles from there.

THE hullion statement of the Ontario, Utah, mine shows a production of 66,129 fine ounces silver for the four weeks ending December 7th.

THE Park View Mining Company, at Crevasse, Mont., will construct a five-mile flume early next season, and a 100-stamp mill will he placed in operation.

GLOBE, Arizona, papers hear of a probable reduction of wages there to $2.50 per day, owing to the large number of men arriving there seeking employment.

THE recent mineral statistics published herein regarding several Pacific Coast States and Territories were mainly compiled from the annual report of the Director of the Mint.

FOR the past eleven months the fees of the Colorado Secretary of State have amounted to $50,000, most of which came from the incorporators of new Cripple Creek mining companies.

E. H. DICKEY and John McNiel of Salt Lake City. Utah, have hought the Mechanics' mine, near Sutter Creek, Cal.. for $20,000. A hoisting plant is to he erected and other work hegun.

THE Ontario Mill and Mining Company has incorporated; capital stock, $96,000; place of husiness, San Jose, Cal.; objects of the company to carry on a general milling and mining husiness.

GEORGE LOVELOCK, of Lovelocks, Nev., has disposed of the White Cloud Copper mines in northern Churchill, near the Humboldt line, to an Eastern company for $29,000. The money has been paid him.

THE elaterite recently discovered in Carbon Co., Utah, is being worked. It will be sent to Berlin, Germany, where it commands $125 per too, the purchasers paying all freight charges; 550 sacks are now ready.

THE Virginia City *Enterprise* claims the best authority for the statement that as soon as the Hale & Norcross suit is settled every mill on the Carson river will commence working the low-grade ores of the Comstock.

AN old British mining company—Cook's Kitchen—recently winding up its affairs testified that its superintendent had worked ten hours every day in the year for forty-two years, and gave him £150 as a testimonial.

CONTINUED cessation of silver mining has occasioned many idle miners, and consequently an immense amount of prospecting for gold, resulting in its discovery in many districts where, hitherto, its presence was unnoted.

THE Colorado-Oregon Mining Company has incorporated in Oregon. S. J. Ross, O. J. Ross, J. T. Ritchie of Colorado, incorporators; capital stock, $1,000,000: principal office. Denver, Colorado; Oregon hranch office, Baker City, Or.

THE *Democrat* says the ore heing milled at the Virtue mine does not average $8 per ton, yet a twenty-five days' run there produced $22,000, and argues for the establishment at Baker City, Or., of a custom mill and sampling works.

THE Georgetown, Colorado, *Courier* says: "The capital stock engaged in mining in El Paso county would well nigh pay the national debt." Oue day's incorporations last week gave an aggregate "capital stock" of $12,175,000.

THE Old Ironsides Mining Co. has incorporated at Spokane, Wash.; capital, $1,000,000: J. P. Graves, H. P. Palmerston. The Ben Lummon Gold Mining Co. has also incorporated there; capital, $2,500,000: L. M. Boardman, J. S. Parker.

IT's a little late, and Josephine Co., Oregon, should have heen heard from four weeks ago, hut Dudley Smith, of Glenwood Springs, Colorado, comes up with the statement that he found a gold nugget in the craw of a turkey last week.

THE Takon group of mining claims in Silver Bow Basin, Alaska, have heen sold to W. E. Ehner for $40,000. The group consists of seven claims, and embraces a ten-stamp mill, flumes, tramway and right to 2000 inches of water from Gold creek.

IN this city last week were incorporated the Pioneer Gold Mining Co.; capital stock, $2,000,000; directors, J. Barton, J. Curry, L. F. Reichling, G. Goodhan, T. Boyson; and the Sumdun Chief Mining Co.; capital stock, $500,000; directors, J. Cross, A. H. Winn, H. G. Stevenson, E. L. Jeffrey, W. H. Payson.

SECRETARY OF THE INTERIOR SMITH declares that a patent for a mining claim may issue upon the application of a company, though the location of said claim he made hy an individual in whom the possessory right remains, where it is shown that in fact said location was made for and in behalf of said company.

AN Idaho paper reports the discovery of a Montana gold field which, it is alleged, will produce $132,000,000 "in the first vertical 100 feet," "$1,320,000,000 in the first 1000 feet," "$2,640,000,000 in the second 1000 feet," and so on. While the figures in the Idaho compositor's case hold out there need he no limit to the matter.

WHATEVER the numher of veins within the surface lines of a claim, the location must he hased on some one vein. Though at the time of location a shaft has not been sunk to the discovery of mineral in place, yet, if this is done afterwards, and hefore the rights of others have attached, the discovery will relate back to the location.

ACCORDING to a recent decision of the Oregon Supreme Court, picking rock from the walls of a shaft or outcropping of a ledge and testing it in order to find a paying vein cannot be credited as part of the $100 worth of "work and improvement" required to he made by a locator on his claim within one year from the date of his location.

ACCORDING to the Cripple Creek *Mail*, D. H. Moffat and Eben Smith, two Denver hankers, are negotiating with the Scotch owners of the MacArthur-Forrest cyanide process for a controlling interest in the patents in the United States. An offer was made some weeks ago and accepted by the foreign owners, hut the sale bas not heen completed.

TALKING of Rhodesia, where he is now actively engaged, Capt. Jefferson Clarke says: "The formation is such as to lead me to believe that the reefs are all fissures. At any rate, the formation is a correct one to find fissure veins in, and I helieve that, with the proper work of development, these reefs will he found to be of that nature."

THE Register and Receiver of the U. S. Land Office at Redding publish a notice in the Yreka *Union* of the Central Pacific Railroad Company's intention to apply for patents on a large area of land in Siskiyou county, principally in the mining sections, and all protests or contests must be filed in the Land Office within sixty days, or hefore February 12th, 1896.

MINING TERMS local in their nature are not unusual. The current numher to hand of the Australian *Mining Standard* has an article on "Bottoming Duffers." To a California miner that is not suggestive of any meaning. Our transpacific contemporary uses it as a convenient term to indicate the proof hy sinking that certain ground wasn't worth working.

APPLICATION is made at Newark, N. J., for a receiver for the Enterprise Mining Company, incorporated under the laws of New Jersey, with a capital of $2,500,000. The property and mines are situated in Rico, Colorado. The company was incorporated in 1890. It has paid $825,000 in dividends. During the past two years no dividends have heen declared, it heing impossihle to work the mines at a profit.

DESPITE all attempts at "profound secrecy," the owners of the property permit it to he known that io Mendosa, South America, have heen discovered gold quartz mines, "the ore from which assays thirty-five ounces to the ton." The information is further vouchsafed that "coal and water are near hy, and the ore is free milling." The combination would appear to be irresistihle.

FOLLOWING are recent Washington State mining iocorporations: The Puget Sound Iron and Steel Works of Tacoma; capital stock, $30,000; J. L. Roherts, A. Lister, A. C. Marconnier. Red Hill Mining & Smelting Company of Spokane; capital, $1,000,000; W. W. D. Turner, J. W. Wentworth, D. W. Henley. The Royal Canadian Gold Mining Company of Seattle; capital, $500,000; S. G. Simpson, J. H. Woolery, E. J. Powers.

THE right to mine can only he given on puhlic lands. When land becomes individual property the Government loses control of it entirely. If patent issues for agricultural lands on which there is a known lode, title to the lode does not pass. The same rule applies to known placer ground. But if a patent is granted hefore the mineral character of the ground is estahlished, it is not open to contest and the title passes from the Government.

IT is argued in these closing weeks of '95 that another mining "hoom" is due. 'Tis now nearly fifteen years since there was any abnormal development in the industry of huying and selling mining shares. As for the husiness of mining, there has heen considerahle of a "hoom" in that since the panic of '93 made gold mining the most profitahle of any avocation, and since the development of electrical industries created such an enormous demand for copper.

SECRETARY HOKE SMITH has approved grants to the Oregon and California Railroad Company, 23,947 acres in the Rosehurg and Oregon City land districts, Oregon; 167,991 acres in the Rosehurg land district; 58,396 acres to the Central Pacific Railroad Company in the Redding district; 32,968 acres to the Oregon Central Railroad Company in the Oregon City district; and 3539 acres to the Southern Pacific Railroad Company in the San Francisco and Visalia land district.

THE London mining papers tell the following, which may he true; it is of Barney Barnato. A country parson wrote to him: "My aim has always heen investment, not speculation. When your hank came out I regarded its shares as an investment and purchased 400 of them at £4, sinking my little all in them, and a good deal more. They have now fallen to £2, and I am undone. I cannot face my parish as a hankrupt, and what am I to do? I throw myself upon your mercy." Barnato was deeply moved by the appeal, and replied that he would buy back the shares at £4. On receipt of tbis reply the guileless parson wired to his hrokers to "huy 400 shares of Barnato hank stock at £2 and send them around to Barnato Brothers, who will give you £4 for them."

THE owners of the Yakima group and Cumberland mine, Slocan district, B. C., have organized two companies to work these properties. The one to work the Yakima group is called the Sunshine Mining Company, and the one to work the Cumherland is called the Cumherland Mining Company. Each company's capital is $500,000, and hoth have the same officers, namely, W. H. Yawkey, president; N. D. Moore, vice-president and manager; W. C. Yawkey, secretary and treasurer. Head office of hoth companies, Three Forks, B. C.

A CHICAGO paper says: The estahlishment of a Mining Stock Exchange in Chicago is now an assured fact. The scope of enterprise has heen broadened so as to include not only mines of all descriptions, hut mineral products. Cripple Creek and other mining shares will constitute hut a small part of the business of the hoard. Negotiations have already heen entered into for the listing of Michigan copper mining stocks, which are now extensively traded in on the Boston Exchange. Montana, California, Utah and Alaska mines will he reported.

THE United States Treasury Department has prepared a statement of specie exports from the Pacific coast ports for Novemher, as compared with the same period in 1894. Silver bars, $738,548, a decrease of $231,052; Mexican dollars, $1,455,586, an increase of $1,001,441; South American dollars, $3000, a decrease of $16,400; silver coins, $29,500, an increase of $10,973; gold, $491,002, a decrease of $263,297. In eleven months the silver shipments from the Pacific coast to Hongkong and other Chinese and Japanese markets have heen over $16,500,000 against $12,000,000 last year. This accounts for the small shipments of silver from London to the Eastern markets.

THE Philadelphia and Reading Coal and Iron Company is preparing to introduce new methods of mining coal in its pitching veins in the Schuylkill region. Hereafter the slopes, which have been in use during the last thirty or forty years, will he done away with and big shafts suhstituted. The first of these shafts is about to he sunk on the tract of the Potts colliery at Locustdale, and will be a vertical opening of at least 900 yards in depth. It is claimed that this shaft will revolutionize the methods of coal mining in the extensive Schuylkill region, as the methods of slopes now in use become too hazardous and expensive when driveu over a depth of four lifts, or 600 yards. The Reading officials will attempt, at the same time, to continue the old Bast colliery slope 1,400 feet deeper, in order to tap the basin, hut in the future shafting will he used.

THE case of the Spokane Falls and Northern Railroad Co. against the Paris Belle Mining Co. is on trial in Victoria. The Paris Belle mineral claim was located on ground in the edge of the town of Rossland, which was included in the grant of lands made by the Canadian Government to the railroad company in consideration of their building the Nelson and Fort Sheppard Railway. The question to he determined is what rights could he acquired under a mineral location made on granted land. The Paris Belle Co. contend not only for mineral rights, hut surface rights as well. If the surface rights are granted the ground hecomes valuahle for town property. There are several mineral claims of this class there. If they all carry surface rights there would he little townsite left for the railroad company.

AS INTIMATED in these two columns two weeks ago, a hill has heen introduced into the House "for the relief of the California miner." It was introduced on the 17th hy Congressman McLachlan aod provides for the suspension of the assessment clause for '95, the same way that it was suspended in '94 and '93. It is ridiculous to introduce such a bill now. No miner wants it; even if he did, it is too late to be effective. The result of its passage would he to put a premium on lethargy and punish those who in good faith did their assessment work for '95 hy making it easier to delay and more profitahle not to comply with the law, in hopes of final relief in the closing days of the year. Should this mistaken measure pass, it will result in no assessment work heing done in '96, in the expectation that in the final weeks of the year similar legislation will make it unnecessary.

FOR the months of June, July. August, Septemher and Octoher, '95, the Alaska-Treadwell Co. show an aggregate result as follows: Bullion sold, $3.68 per ton of ore, $427,197; total expenses, mining 116,290 tons, forty-eight cents, $56,335.44; milling 116,290 tons (1992 tons concentrates), twenty-nine cents, $32,254.59; chlorination, 1998 tons treated, eleven cents, $13,162.77; general expenses Douglas Island, eleven cents, $12,544.06; general expenses San Francisco, two cents, $2311.20; general expenses Loudon office, one cent, $985; hullion freights and charges, five ceots—$1.07, $5597.63; constructioo, $151.86—$124,342.55; net profit realized, $2.61—$303,028.58; cost of roasting and chlorinating, $6.59 per ton of concentrates. The costs per ton were lower and the profits greater than for any other similar period in the history of the company, which has earned in these five months more than its regular annual dividends. Beside the regular quarterly dividend of 37½ cents per share, the company will pay an extra bonus dividend of $100,000 on the 23rd.

TELLURIUM is said to he recently discovered in Cripple Creek, Colorado. It is one of the rarest of metals, has heen found in small quantities in this State and in Colorado, in combination with the gold ore, to which it is almost always allied. It is also reported in paying quantities at Long Lake, near Midway, B. C. A prospector, hy access to a blowpipe, alcohol lamp and a little cold sulphuric acid, can readily determine the presence or ahsence of tellurium in gold ore supposed to contain it. Break off a small piece of the ore, place it in a warmed porcelain dish, apply the hlowpipe until the ore is at an oxidizing heat, put two drops of the sulphuric acid on the porcelain dish and allow to mix with the ore—the reaction will immediately follow, if tellurinm he present, hy carmine and purple colors. The metal fuses at ahout 500° C., and is distilled at a very high temperature. Its vapor is golden yellow and has a very hrilliant absorption spectrum, while the electrical conductivity, like that of selenium, is largely influenced hy the temperature previous to heat, increasing after exposure to light, though not to the same extent as does selenium. Tellurium hurns, when heated in the air, with a hlue flame, enveloping white vapor of tellurium dioxide. It is insoluhle in water and carbon disulpbide, but dissolves in cold fuming sulphuric acid, imparting to the solution a most pleasing carmine color, which almost immediately passes into a purple. Tbe compact form is a silver white, resplendent

metal of a markedly crystalline structure. Its atomic weight is 125; sp. gr., 6.2. The precipitate of tellurium is at present worth about eighteen cents per gram.

THE incorporation laws of Colorado insist that the names of all incorporations doing business under the laws of that State shall begin with the word "The" and end with "company." These injunctions have always caused a lot of trouble at the office of the Secretary of State. Filers would go to a lot of trouble getting their companies into shape, decide upon a name and elect boards of officers under them, and then offer their papers for filing. In a very large percentage of cases the papers would be refused because either the "The" or the "company" or both would be lacking, the result of which would be a hasty meeting of the stockholders of the company and the name patched up to meet the requirements of Colorado laws. But now the *Republican* says there is a new trouble—names are running out. There is not a day passes that the department is not called up twenty times by organizers asking if such and such a name has been appropriated. That most generally asked for is the "Cripple Creek Gold Mining Company."

H. A. EVANS, writing from Rossland to the Spokane, Wash., *Spokesman-Review*, in regard to the claim-jumping which has been indulged in, says: "All kinds of claim-jumpers are to be found in Rossland. We have lawyer jumpers, surveyor jumpers, professional jumpers and others. The lawyer pays the professional to relocate claims; the bum jumper relocates and gives the lawyer a half interest to fight the matter in the courts. This causes the poor prospector to employ another lawyer, for which he gives half to defend the suit. This is the way matters have been going on in the district for some time. No sooner is a claim located than one of the class of jumpers will proceed to pull up the stakes and then swear the original locator had no stakes on the ground. The numbers are erased and the posts are used in the new location. This is the way the poor prospector is robbed of his hard-earned claims. It is simply impossible for a poor man to hold a claim within three or four miles of Rossland if there is any ore in sight unless he lives on the ground and carries a rifle."

Mineral Land Commissioners' Report.

The Mineral Land Commissioners for the Helena district made their report to the department this week. There were examined and classified by the commissioners during the year 349,070 acres. Of this 67,610 acres were classed as mineral and 281,460 acres as non-mineral. The total cost of the work to the Government was $8131.55. The salaries of the commissioners formed the chief item of expense, aggregating $5990. The cost of the examination and classification per acre was two and three-tenths cents.

In the report an estimate is made by the commission on the time it will take to complete the work of classification as now contemplated by the law. There are in the Northern Pacific land grant in the Helena district—exclusive of the first and second indemnity lands—3,409,960 acres. Of this there are 1,353,780 acres of surveyed lands, 2,056,180 acres unsurveyed. There remain of the surveyed lands yet to be examined 1,004,710 acres. The unsurveyed lands, the commission believes, can be classed next year. Regarding the unsurveyed lands the commission says in its report:

"From the above estimate, based upon the experience of the past year, and believed to be substantially correct, it appears that the work in the district can be accomplished in the time limited therefor, that is, 'within the term of four years from the date of this act,' provided, however, that reasonable facilities and proper and necessary clerical assistance, and the aid of a small surveying corps to be attached to and placed under the direction of this board, be furnished to aid in the prosecution of such work."

The commission asks to be provided with a clerk, that it may devote all its time to the work of classification, instead of spending a part of it to clerical work, as during the present year. A civil engineer is also asked, with the necessary assistants, to establish and raise monuments at the boundaries of the unsurveyed tract of lands examined and classified by the board.—Western Mining World.

"Will Clean It All Up During 1896."

The following part of an editorial in the Marysville *Democrat* is interesting, coming from a source that, though not friendly, tries to be fair:

During the present year there has been a continued warfare, on paper, between the Miners' Association and the Southern Pacific Company relative to what the former designate mineral lands. The lands in controversy are principally in the grants to the Central Pacific Company, and the California and Oregon. Early in the season men were sent to Washington in the interest of the Miners' Association, to use their influence to defeat the patenting of the lands to these companies. It was then that the *Record-Union* jumped onto hydraulic mining with both feet. It denounced the Caminetti law, the U. S. Debris Commission and miners in general. The Commissioner of the General Land Office and the Secretary of the Interior paid no attention to the ruction, but continued in the even tenor of their duty. Since the commencement of the present year more than 600,000 acres of land in these grants have been patented to these companies. Last week 233,946 acres were approved for patent, and if the officers continue as in the present year they will clean it all up during 1896.

The Pneumatic Torpedo Plant at Fort Winfield Scott.

Written for the MINING AND SCIENTIFIC PRESS by EDWARD A. RIX, P. E.

About one year ago the Pneumatic Torpedo and Construction Co., of New York, accepted bids for the construction of the power plant for the pneumatic dynamite gun plant at Fort Winfield Scott, in San Francisco.

The Eastern manufacturers had the advantage of the Sandy Hook plant, the Shoeburyness plant established in England and the two plants established on the El Cid and the Nichteroy, which were furnished to the Brazilian government. Yet the company decided in favor, after competitive bids, of the plans furnished by the Fulton Engineering and Shipbuilding Works, of this city, which were designed by Mr. Edward A. Rix, of this city.

This plant has just been tested, during the last week, by the Government board, and the results have shown that the quality of the machinery and the character of the tests in every way exceeded those made at Sandy Hook during the last installment made by this same company.

The Rix air compressors are two in number and of the duplex pattern, each of about 400 H. P. capacity. The air is compressed in the first cylinders to 75 lbs. to the sq. in., and is thence taken into a cooling tank containing about 1000 running feet of one-inch copper pipes, in which the air is cooled from the temperature of its discharge from initial cylinders, which is about 320 degrees, to the temperature of the water or thereabouts. It is delivered to the intermediate cylinder at about 65 degrees in temperature, and is there compressed in a single-acting ram to about 400 lbs. pressure. The air is thence taken again into the intercooling chamber, through about 400 feet of copper pipe and is cooled again to the temperature of the water and is delivered to the high-pressure cylinder at the same temperature as to the intermediate cylinder.

In the third cylinder it is compressed to 2000 lbs., the air being delivered at a temperature of about 358 degrees. This is conducted to the third intercooler, where the temperature is reduced to about 65 degrees, and is thence conducted to the storage reservoir.

The engines which drive this compressing plant are of the Meyers cut-off style, and are extremely well balanced and well constructed; in fact, the cards and the results show that these compressors have a mechanical efficiency of about 85%, and throughout the system there is a saving of 36% over the work required to compress the air to 2000 lbs. adiabatically.

The amount of air delivered per hour, at 2000 lbs., is about 460 cu. ft., which is more than ample to keep the machines in operation, in fact, during the test one machine would have been sufficient to have maintained the number of shots.

One feature about this whole compressing plant is the facility with which the air is cooled. Each cylinder has a number of independent circulations, notably the high-pressure cylinders, where four circulations are introduced, each independent of the other, viz., a circulation for the head and valves, two circulations for the cylinders and a circulation of water within the ram itself while it is in operation. This preserves the packing of the ram and at the same time contributes largely to the cooling of the air during compression.

During the operation of the plant, the initial temperatures, that is the temperatures of the inlet for each air cylinder, did not exceed 70 degrees, while the temperature for the discharge of the air varied from 290 to 350 degrees.

The mechanical efficiency of the plant, that is the ratio of the indicated horse power in the the steam cylinders to the I. H. P. of the air cylinders, was 85½%, which is quite high, considering the fact that the machines were not designed for extra economical use, the idea being to provide for the Government something that could be operated easily and which was not easy to get out of repair.

After passing the intercoolers the air is delivered into 24 storage tanks, each 16 inches in diam. by 24 ft. long, containing about 650 cu. ft.

These tanks are connected with the firing manifolds. These manifolds are of complex construction, designed so as to admit the air to any or all of the guns and to admit the air to any or all of the storage tanks.

The air in the storage tanks is maintained at 2000 lbs., while the air delivered to the storage tanks of the guns is at 1000 lbs. pressure.

The guns themselves are very interesting in their character. They weigh about 70 tons each, above their foundations, are 50 feet long by 15 inches in bore. They can fire projectiles of any caliber from 8 to 15 inches, the difference in caliber between the full and the sub-caliber being made up by wood pistons in four sections which surround the projectile and which fly off immediately upon leaving the gun. These projectiles vary from 11 feet long to 15 inches in diam. of the full caliber, to 8 inches in diam. and 8 feet long in the sub-caliber. The latter carry about 100 lbs. of dynamite explosive and the former carry 500.

The guns are easily traversed around the whole 360 degrees of circle, by an electric motor placed within one of the supports of the gun, and the connections of this motor are so arranged that it will also operate the mechanism for elevating and lowering the muzzle. The gun is ranged from 0 to 35 degrees, which is considered ample for all ordinary purposes. The greatest range obtained with the 8-inch projectile, carrying 100 lbs. of dynamite and which flies under a loss of pressure of about 100 lbs., was 5000 yards and slightly over. This may be considered the maximum flight for usual purposes. The 10-inch is proportionately less, and the 15-inch projectile, which carries 1000 lbs. of dynamite and weighs 1100 lbs., has a range of from 2000 to 2500 yards. All of these projectiles may be thrown accurately, in fact there is no reason why, with the same pressure, the same amount of air wasted in the throwing of the projectiles, the same weight of projectile and the same character of projectile, the atmospheric conditions being the same, it should not land practically in the same place. The results at Fort Point demonstrated this. The 8-inch projectiles were thrown from 5000 to 5070 yards, and were placed in the target, 70 yards in length by 30 yards in width, which far exceeded the Government requirements.

The material used in these projectiles is nitro-gelatine, composed principally of nitro-glycerine and gun cotton. The whole projectile is of an intricate mechanism and has provisions made for exploding the charge either by direct impact, side impact, or by a delay of from one to three seconds. These projectiles are expensive, probably costing $1000 each, and their capacity for destruction is fully proportional to their expense.

In the test at Fort Point, the 15-inch projectile at 2000 yards threw up a column of water 350 to 400 feet high and 100 feet in diameter at the base, showing conclusively that it would be amply capable to destroy, within a range of 100 feet, the largest man-of-war.

The boilers which actuate this plant were manufactured by the Chandler & Taylor Co., of Indianapolis, are of about 500 H. P. capacity and are operated under forced draught, the idea being to keep the stacks low enough to be invisible from the bay. All of the fans which furnish the forced draught are each capable of furnishing 13,000 cu. ft. of free air per minute to the grates. The boilers are fed by Deane duplex steam pumps, which are reinforced by sets of injectors.

The dyuamo is operated by an Armington & Simms engine, of about 50 H. P. The dynamo is capable of furnishing 300 amperes, at 125 volts. The dyuamo was manufactured by the Electrical Engineering Co., of this city, and is first-class in every respect. It also furnishes about 50 lights for the engine room and offices during the evening.

The compressors and guns, in all the requirements exacted by the Government, have probably exceeded these requirements by a combined percentage of more than 1000%. There was not one hitch or delay during the tests, excepting those caused by the weather, and judging from expressions, the entire Department feel that they have in these guns and the machinery to operate them a most efficient and satisfactory plant.

"Hope Springs Eternal in the Human Breast."

Under date of the 16th inst. a Solano county, Cal., subscriber writes as follows:

Upon the wrapper I see that my subscription expired 10th inst.

Thy servant hath nor scrip nor coin,
Nor knoweth he the coming morn
When friendship's ties and coin galore
Shall add tres pesos to thy store.

O promise! thou, most devious thing,
A wild bird loose on speedy wing,
A sugar-coated, bitter pill—
Sometimes may cure, ofttimes may kill.

When the wheel of fortune turns again
You'll hear from the cabin of William of Wayne.

GOLD is being produced in the Cripple Creek district to an encouraging extent, and on the strength of this a large number of "mining companies" is being organized there. The situation leads the Cripple Creek *Mail* to sound a note of due warning. Speaking of these meretricious organizations, it says: "It is safe to say that the great majority of them will never attempt to operate here. Their mission from the start is to fleece outsiders by means of worthless stock, and it behooves the uninitiated to be a little wary about investing in stocks of unknown value. Many of these companies do not own anything except a stock book. Others that are nearly as bad are companies of doubtful ownership, having nothing but unpatented claims. And there is still another class to be avoided—the companies composed and officered by obscure, irresponsible, incompetent and disreputable men. Many of these men have not a dollar and wouldn't know a mine if they saw it. We say to investors: Go slow about buying mining stocks until the same is proven of value."

Scientific Progress.

Heat Insulating Material.

Experiments give the following as the conductiug power per square foot of four materials, difference of temperature 1° Fahrenheit:

Copper	515 heat units per hour.
Iron	233 heat units per hour.
Ordinary stone	13.68 heat units per hour.
Powdered chalk	.869—or less than one heat unit.

Hence, copper conducts 593 times as much heat as the chalk, iron 268 times as much, aud ordinary stone 15 times as much. Chalk is used in the illustration because it is very similar to the three materials that are being most largely used in combination with ashestos in making high temperature coverings—infusorial earth, carbonate of magnesia and gypsum each being dependent for its strength largely upon the ashestos incorporated with it.

Porousness is one of the necessary qualities of good non-conductors, and this porousness uecessarily tends to weakness, heuce clothing for steam pipes wears out. Means for counteracting this natural weakness and for making coverings permanent are needed. There is only one practicable way to render coverings really permanent—to strengthen them by reinforcing with iron. Iron can be so incorporated in the hody of the covering that the atmosphere cannot reach it; the life of iron thus protected from the atmosphere is almost unlimited, and thus situated it will hold the covering in place indefinitely, making it really permanent.

A high degree of permanency is attained by using one inch thick of any of the well known mineral coverings, aud outside of this from a half inch to an inch of wool felt paper, made into solid tuhes and securely fastened over the mineral coverings.

Felt paper pipe coverings, while excellent non-conductors, have heretofore failed of permanency because they were placed so near the hot pipes that they were gradually hurned up. With au inch of good mineral insulation next to the pipe this charring weakness of the felt paper is entirely overcome, and the paper tuhes heing very strong will, if properly fastened, hold the magnesia, asbestos, or other mineral covering in place two or three times as long as it would otherwise remain.

Less than an inch of mineral under the paper will not protect it, hence this plan means substantially two coveriugs and adds materially to the cost. It is not possible to make heat insulating coverings permanent without making the first cost more than it has heretofore heen, but hy increasing the cost they can be made permanent.

Ashestos is the ouly mineral known that furnishes fihers long enough and stroug enough to he woven into strong threads. It is to a high degree fire and acid proof. These properties adapt it to many useful purposes and it is the only material yet discovered that will do for some of these purposes.

Broadly speaking, asbestos is a silicate of magnesia, but in some cases lime displaces the magnesia hase; in rare cases alumina takes the place of the magnesia, and what is called hlue ashestos is a silicate of iron, irou in this case displacing the magnesia. This hlue asbestos or fihrous silicate of iron possesses mauy times the strength of true asbestos, a thread of it one-twenty-fifth of an inch in diameter carrying one hundred pounds, but hy reason of its contaiuing from 30 to 40 per cent of protoxide of iron it is neither fire nor acid proof; nor is it a good uon-conductor of heat, hence does not possess the valuahle properties of true asbestos. Silica and water are the only two elements that are always constant in ashestos, the silica rarely falling below forty parts to the huudred, while in some of the anhydrous varieties the water falls as low as two or three parts to the huudred.

There is a duty of twenty-five per cent on all except crude and ground ashestos and paper stock, and if the tariff laws were enforced the people of the United States could he supplied in the main from Wyoming, and thus give ashestos the benefit of the policy of our Government in protecting American industries; hut at present all kinds of manufactured ashestos fiher are heing imported from Canada, free of duty, under the classification of ground asbestos and paper stock. The provision for admitting ground ashestos and paper stock free was only intended to apply to these, heuce the present ahuse of our tariff laws, hy which fiberized ashestos is admitted free, defrauds the Government and discourages the production of asbestos in the United States.

Fire Under Water.

The hurning of phosphorus iu water is a safe and simple experiment. A few grains of phosphorus, say four or five, ahout half the size of a coffee hean are thrown into a tall glass filled with water. Then throw in from a quarter to half an ounce of chlorate of potash. Introduce a long-stemmed glass funnel and add slowly about half an ounce to an ounce of sulphuric acid. For greater safety place it in an empty fireplace, as fumes are driven off in the chemical reaction which takes place, which are disagreeable if not actually poisonous. They are so slight, however, that in an ordinary sized room this precaution is not an absolute necessity, although it is desirahle. In a short time brilliant sparks will be emitted in the water, and fire will hlaze, increasing to a not alarming hut still hrilliant degree. A slight crackling noise will he heard.

The action will continue for nearly half an hour in a somewhat decreasing degree, but still exceedingly beautiful. While the experiment is extremely simple in itself and costs but a few cents, the chemical reactions which take place are rather intricate. Following are the various reactions which occur in producing this beautiful effect:

$K C L O_2$ = Peroxide of chlorine.
$K C L O_3$ = Chloric acid.
$K C L O_4$ = Perchloric acid.

The action of sulphuric acid on chlorate of potash, $K C L O_3$, is to decompose a portion of the chloric acid into $C L O_2$, a very explosive yellow gas, which breaks up into C L and O at a gentle heat, which in our experiment it gets hy the mixture of sulphuric acid with the water. It inflames the phosphorus at the moment of explosion (the crackles we hear), and supplies it with bubbles of oxygen to hurn it. The whole action is:

$$3 K C L O_2 \; 2 K H_2 S G_4 = 2 K H S O_4 \; 2 C L O_2 \; A_2 O.$$

$K H S O_4$ is an acid sulphate of potassium in which an atom of H is replaced hy K.

Proposed Substitute for the Turbine.

A scheme for utilizing the power of a waterfall is attracting some attention in Canada, where, it is said, an attempt is ahout to be made to develop 175 horse power by this method. The essential principle involved is the compression of air by the force of the falling water, and the employment of the compressed air for driving a motor, either close at hand or at some distance. From a tank or standpipe, in which the water stands at the same level as ahove the dam, the fluid is permitted to pour down a pipe, around whose base are a lot of holes, admitting air from tuhes running up to the surface of the water. The air is sucked in and compressed by the heavier fluid, and the two are automatically separated hy gravitation.

The air finally passes into a storage chamber. The incredihle statement is made that from 70 to 80 per cent of the latent power stored in falling water can he rendered available in this manner. This is no more than a turhine yields; hut a water-wheel cannot transmit its energy to a distance without intermediate agencies like dynamos (which entail a slight loss), whereas compressed air can he used to run machinery fifteen or twenty miles away. According to the Buffalo *Express*, a stock company has been formed to introduce the Taylor system, and a Canadian college professor of engineering is named among those who have given it approval. It is asserted that a power plant of this class is about to he installed at the Dominion Cotton Mills, in Magog, near Montreal.

Mechanical Progress.

A Wonderful Light.

In the lamphouse of the government lighthouse station at Tompkinsville, Staten Island, is housed the most wonderful light in the world. The light itself stands fifteen feet high, the face of its bull's-eye is nine feet across and its lenses are as much as four inches thick. It is capable of flashing a ray of light equivalent to the power of 250,000,000 candles, and the distance from which it can be seen on clear nights is practically limited only to the curvature of the earth.

That part of the light which revolves weighs fifteen tons and so exquisite is the mechanism by which it is moved that the pressure of fingers will turn it. A child could control the machinery, and the motive power which propels it is a single hit of clockwork incased in a hox two feet square.

The light consists of two concave discs about eight and one-half feet in diameter. These discs are placed back to back about a foot apart, and in position look like tremendous double convex magnifying lenses, so large that they could not be cast in two single pieces, and had to be built up in segments, and the whole strung together on a great iron skeleton. And this, in point of fact, is precisely the case.

Back to hack, the lenses inclose a hollow interior, into which is thrust a powerful electric light. This light of itself is about 7000 candle power. When its light is projected through these huge magnifying prisms, its power is iutensified more than 35,000 times.

It is altogether beyond the human imagination to grasp the possible effect of 250,000,000 candles, which is the illuminating power of this new lighthouse wonder. At the present time the finest oil lamp which ingenuity has been able to devise may he seen on a clear night some 35 or 40 miles at sea. The new light may he seen at a point 120 miles away.

Accuracy of Workmanship.

Advance of accuracy of workmanship in machinery is one of the remarkable features of manufactures. Formerly, if a shaft could be made right within one thirty-second of an inch, all was well. Iudeed, under old processes, this was as fine a degree of correctness as the eye could perceive. But this was altogether too far from perfect to answer many purposes, and mechanics set about devising some means to insure more absolute accuracy. One of the first suggestions that the eye was less reliable than the fingers came from the fitting of certain cylinders with plugs. It was fouud that a uumher of plugs could be made, all precisely alike so far as the eye could judge, hut the veriest novice detected a difference in their size the moment they were applied to the hole for which they were intended. It is said that now the difference of one five-thousandth of an inch can readily be perceived by the most experienced person.

Table of Specific Heat.

Water	1.000
Vinegar	.920
Strong Brine	.700
Alcohol	.659
Ice	.504
Oil	.310
Air	.238

By "specific heat" is meant the capacity of a suhstance for absorbing heat, and is the amount uecessary to raise or lower a substance one degree. The table indicates the ratio of quantity required to raise or lower an equal weight of water one degree. Example: One pound of water raised or lowered one degree Fahrenheit is called one thermal unit, and at 32 degrees its specific heat is one. The amount of negative heat uecessary to cool 100 pounds of water 10 degrees would be 100 pounds multiplied by one thermal unit, multiplied hy 10 degrees, which equals 1000 units. To cool 100 pounds of alcohol 10 degrees Fahr., as per ahove table, would require $100 \times .659 \times 10 = 659$ negative heat units. Hence it appears that only about three-fifths as many negative heat units are required to cool alcohol as are required to cool an equal quantity of water.

The New Maxim Gun.

Mr. Maxim's special pet, his "daily," is the marvelous gun that does not fire single shots, hut literally "rains bullets." It is a light affair, having the appearance of a small brass cannon, mounted on a tripod and aimed and worked by one man, who sits behind it, on a saddle like that of a bicycle, from which he can poiut it up and down with as much ease as if it were a pistol, or swing it to the right or left, as an enemy approaches from one or another quarter.

The gun loads itself. It utilizes the recoil, so that (as the cartridges are strung on a belt, that carries from 150 to 400 rounds) every kick of the gun throws out the exploded cartridge on one side of the gun, and on the other throws the next cartridge into place, so that the discharge is incessant. One has only to press the hutton and the gun does the rest. As long as one keeps his finger on the button, the firing goes on, the gun throwing eleven minie bullets a second—666 a minute!

That steel harrel, through which an incessant flash streams like a continuous streak of lightning, melting or exploding everything near it, is incased in a water jacket, so that the gun, like a good soldier, keeps cool while doing its most deadly work.

The man at the gun is master of the situation, and ueed not run away even if he is attacked hy a regiment unless it comes upon him hy surprise and takes him at close quarters, or some villainous sharpshooter picks him off before he gets to business. Let the regiment keep at a respectful distance and give the hrave fellow a chance, and he will lay them low hy hundreds; and indeed, let the enemy be ever so numerous, if they will only stand up like men to be shot at, he will mow dowu half a dozen regiments while he is smoking his cigar!

A New and Practical Invention.

A device has heen introduced to take the place of the wooden plugs generally used when it is desired to screw into hrick or plaster walls. It is a spiral of iron wire doubled hack upon itself, the inner turns being of such a diameter as to form a kind of screw thread, while the outer turns serve to hold the wire plug in the wall. To fix these plugs a hole is drilled in the wall a quarter of an inch greater in diameter than the outside dimensions of the plugs and a little deeper than its length. The hole is then thoroughly wetted by injecting water and afterward filled with plaster of Paris. The outer windings of the wire socket are also filled with plaster, and the socket or plug with its screw is inserted in the hole to the required depth. After the plaster has set the screw may he removed, and it should he greased before it is put hack. This device will be of use to electrical fitters for fixing switchhoards, switches, pushers and other electrical fittings, as well as to decorators and plumhers, especially when fitting has to be done in houses already occupied, where the saving of litter is an object. In new houses the wall plugs are placed in the plaster at different points where there is a likelihood of supplementary fittings being subsequently required.

Electrical Progress.

Track-Laying Machines.

In the laying down of street railways great inconvenience is caused to the public by the obstruction due to the piling of rails, ties and track material at the sides of the road ready for use when wanted, and by the carrying of these materials across the road during track laying, especially on busy streets. Excellent work has been done by an improved track-laying machine in showing how this source of trouble can be avoided. A horse-car line on the Wentworth-avenue line of the Chicago City Railway was being equipped for electric traction. The rails weighed eighty-three pounds per yard. In conducting the work by means of the track-laying machine the rail chairs were first placed, and then the rails were lifted and lowered into place. Two men only were required for the work, one man for operating the engine and one to attach the tongs to the rail and to swing and guide it into position. The total cost of operation per ten-hour day was $5, or a saving, according to the contractor, of $15 per day over the ordinary method of lifting and placing the rails by haud. About 2200 feet of track would be laid complete in a ten-hour day. An improved form of the ordinary track-laying machine, which has a series of tramways about thirty feet long and twenty inches wide, fitted with heavy rollers, the tramways attached to the sides of flat cars and supported by plank projections, are of much lighter construction. The cars are of the skeleton flat type, about thirty feet long, six and one-half feet wide, and thirty inches high, and weighing about 2200 pounds each, with tramway attached. Four men can put all the parts together of the four cars sent with each machine, in one day. When the cars are loaded they can be sent to the front by steam, electric or horse power, and one team will give all the power needed. This plan of track laying saves great expense. A practical builder of electric railways has estimated the cost of hauliug and distributing rails and ties with teams for a road ten miles long at an average of $170 per mile, and says that considerable loss of money and time is sustained by damage suits caused by horses taking fright at the piles of material scattered along streets and roadways. The track-laying machine reduces one of these expenses to a minimum, and absolutely banishes the other. Besides this, it reduces the pilfering of material and tools, makes danger lights unnecessary, and saves damages to rails in unloading.

Edison and His Inventions.

Being recently asked as to how much money he has made out of his inventions T. A. Edison said: "Considered purely as inventions, they have cost me more than I have ever received from them. Nine of my inventions have proved very profitable. These are the district telegraph system, the quadruplex system of telegraphy, the stock ticker, the telephone, the electric pen and mimeograph, the incandescent lighting system, the electric railroad, the phonograph and the kinetograph. I claim one-half of the credit for the invention of the first, third and fourth of these and the others are entirely my work. I received very little for the district telegraph. I sold the quadruplex system of telegraphy for $30,000 and spent all of this sum and more trying to devise a plan to make a wire carry six messages instead of four. I failed, and so in the end was worse off then when I began. The stock ticker brought me at different times about $50,000, but it cost me more than that to perfect it. From the telephone I realized a clear profit of perhaps $25,000. Bell made less than half a million, though his farther-in-law rolled up a vast fortune by securing control of large blocks of stock when it was selling for little or nothing. The profits of my electric pen and mimeograph have been very small. The incandescent light has netted me $140,000; it cost me nearly three times that sum to perfect it. I did not get my money back from the electric railway, which I sold out long ago, and I made nothing from the phonograph, which I have also sold. The kinetograph has not as yet returned me the original outlay."

An Electric Rifle.

Heavy guns have long been fired by electricity, but electrically exploded small arms have not hitherto come within the sphere of the inventor. It is hard to see wherein an electrically actuated rifle can for all practical purposes be an improvement on the extremely efficient exploding mechauism with which arms of precision are now fitted, but the designer of a rifle in which the cartridge is exploded by electricity claims that in this method there is none of the flashing out of the powder common with the merely percussion hammer, and all the powder is consumed, to the manifest improvement of the penetrative power of the bullet. A battery is inserted in the stock, with wires running to a strip of metal on the one hand and the hammer, which is fitted on the upper part of the trigger, on the other. The metal strip makes contact with the metal base of the shell. A pin, which runs into the cartridge, has its rounded head projecting slightly beyond the base of the cartridge. Between this and the point of the hammer is a plate studded with a pointed head, which lies close to the cartridge. As the trigger is pulled the hammer flies forward, striking the plate, whose pointed head is driven onto the projecting head of the cartridge pin. The spark thus caused within the cartridge explodes the powder.

SOME IDEA of the diversity of uses to which electric motors are now being put, and the rapid spread of electricity in different directions, may be gathered by glancing at the list of orders for motors received in the Power and Mining Department of the General Electric Company during one month this summer: Operating mining machinery, shoe factory, operating a yarn factory, a tannery, a powder mill, a watch factory, iron working machinery, a foundry, hoists for electric cranes, ventilator on a gun boat, propelling electric launches, the operation of elevators, blowing church organs, operating woolen mills. These orders are scattered throughout the following States: California, Colorado, Indiana, Ohio, Connecticut, Michigan, Pennsylvania, Rhode Island, Wisconsin and New York; Lima in Peru and Rio de Janeiro in Brazil.

NORTH ADAMS, MASS., continues to be puzzled over a queer condition of electricity in the Hoosac tunnel. Although when the great four-and-one-half-mile cut was built no ores, magnetic or otherwise, were encountered, there was a general expectation that rich ore pockets would be found; yet, for an unexplained reason, no electrician has been discovered who can send a telegraphic message on a wire running through from portal to portal of that tunnel, even though such wire ran inside an ocean cable. Messages have to be sent on wires strung on poles over the top of the mountains, fully nine miles, and that is the way the in-going and out-going passenger and freight trains are heralded to the keepers of the two tunnel approaches.

THE Niagara Falls Power Company will extend its wheel pit to accommodate three more turbines to work in conjunction with three new dynamos capable of producing 5000-horse power each. It is interesting to note that among the uses to which the Niagara Falls electric power is first put are three comparatively new industries—the manufacture of aluminum, of carborundum and of calcic carbide—this last-named for making acetylene gas.

Practical Information.

Not So Very Unusual.

Two full moons this month, one on the 2nd, the other on the 31st, have occasioned in several newspapers the statement that not since the birth of Christ have there been two full moons in a calendar month. Reference to old almanacs would at once show the mistake. It is no uncommon phenomenon to note two full moons in one month. The error probably arises from the fact that ordinarily but one full moon is noted in a month, and not once in a thousand years does it occur that no full moon happens to lie within the limits of even the twenty-eight days that three-fourths of the time constitute the month of February. The ordinary term "a month" has no exact standiug among astronomers. There is no astronomical reason why one particular month should have thirty-one days and auother thirty or twenty-nine or twenty-eight. Astronomers have solar months, nodical months, anomalistic months, sidereal months, synodic months, etc. When the ancients commenced to reckon time they used the day and the year. Then they saw the moon and invented the month. Afterward they noted the stars, and observed that a belt around the heavens was marked by twelve constellations, which they called the signs of the zodiac. These divisions proved too inaccurate for modern astronomers, and as a result there are now many kinds of months. The calendar month is the one most generally noted. The solar month is an exact twelfth part of a year, and is reckoned by the signs of the zodiac. It amounts to thirty days and something over ten hours. Then there is the nodical month, which is the time of the moon's revolution from one of its nodes to the same node again, and is equal to 27.21222 days. The anomalistic month is the time of revolution from perigee to perigee again, and equals 27.5546 days. The sidereal month is the time occupied by the moon in passing from one star to the same star again, and is equal to 27.32166 days. The synodic month is simpler, this being the interval from new moon to new moon again. It varies somewhat on account of the eccentricity of the moon's orbit, and of that of the earth around the sun, but its mean value is 29.53059 days, or 29 days 12 hours 44 minutes and 2.684 seconds, with the possible variation of a hundredth part of a second. The reason why this synodical month is longer than the sidereal is that during each sidereal month of 27⅓ days the sun has advanced among the stars and must be caught up with. These figures appear to be sufficiently accurate for all ordinary purposes, but the astronomers are not yet satisfied. They have discovered that the month is a trifle shorter now than in the days of Ptolemy, and this trifle must be computed down to the fraction of a second. But that is another question. Enough figures have been given to show how it is possible for two full moons, which mark the beginning of two lunar months, to happen in a single calendar month. Owing to the difference in the length of the different kinds of months the phenemenon must happen in some month about once in three years. Long before Christ, Meton, a Greek, in an effort to reconcile lunar and solar time, discovered the Metonic circle, which consists of 235 lunar months, and is equal within two hours to nineteen common years of 365¼ days. Every nineteen years the new and full moons recur on the same day of the year, and about the same hour of the day. The calendar of the phases of the moon, therefore, is the same for 1895 that it was for 1876, and that it will be for 1914, except that the leap years may in some cases make a difference of a day. The statement that this is the first December wherein two full moons have occurred is also a mistake. In 1876 there were two full moons in the last month of the year—one on the first day of the month, the other on the 29th.

What Labor Can Make Out of $10 Worth of Pig Iron.

At the recent meeting of the South Staffordshire Institute of Iron and Steel Works' Managers, Thomas Morris presented some interesting facts about the remarkable achievements that have been reached in the manufacture of fine wire. Of the antiquity of wire, Mr. Morris said, there could not be the slightest doubt. That used in the dress of Aaron, the high priest, was stated to have been cut from thin plates of gold, and wire has been discovered that was made as far back as 1700 B. C. It was not, however, until about the middle of the 14th century that wire drawing was first practiced, and then in Germany. Wire drawing was practiced in France at the end of the 15th century, and it was nearly a hundred years later before the industry was introduced into England, during the reign of Elizabeth.

The Forest of Dean was long the seat of the wire drawing trade. In 1663 the first mechanical wire mill proper was erected at Sheen, near Richmond. Birmingham appeared to have taken up the manufacture of wire in the 18th century with characteristic energy, but early in the present century Lancashire began to take the lead, both as regards quantity and quality.

Mr. Morris gave an interesting description of the various articles that illustrated his paper, especially the various wires, and pointed out that the Warrington wire manufacturer who presented him with many of the specimens got $4.32 per pound, or over $8600 per ton, for the specimen of drawn wire, which was largely used in the construction of piano and other musical and mechanical instruments. For the pinion wire he got $21.60 per pound, or $43,200 per ton. It took 754 hair springs to weigh an ounce of 437½ grains. It took 27,000,000 of them to weigh a ton, and, taking one to be worth a cent and a half, the value of a ton of these apparently cheap little things ran up to over $400,000. The barbed instrument used by dentists for extracting nerves from teeth was even more expensive, representing a rate af 2,150,000 per ton. A mile length of No. 19 size wire only weighed 21 pounds, and many of the ingots were 12 to 14 cwt. each and after allowing for all waste they could get 50 miles of wire from one ingot.

Moving a Machine Shop Without Stopping Work.

Recently in the work of track elevation upon the Providence division of the New York, New Haven, and Hartford Railroad, it became necessary to move one of the largest factory buildings of the Sturtevant Blower Works at Jamaica Plains. This building is 50 feet by 350 feet, about half the length of which has three and the other half two stories. The three-story portion was moved about 50 feet east and 300 feet south, and the other part was moved 50 feet east from its former location. The work in the three-story section, except upon the lower floor, was carried on all the time during the removal, power being supplied by a 20 H. P. electric motor, belted from the second floor of the building to the main line of shafting. Provision was made for removing the motor away from the generator, which was situated in the engine-room, by placing a reel containing the conducting wire upon the floor of the moving building, which allowed the wire to unwind and made it possible to keep the motor running while the building was upon the rollers. The moving was carried out in the usual way by means of capstans worked by horse power which were connected to the building by ropes and blocks. The building was thoroughly tied in both directions by heavy iron rods before the moving was commenced, and, though the walls of the first story are 20 inches thick and 16 inches at the second story, the work was done without injury to the structure, in spite of the fact that the latter part of the journey was over filled ground.

Mining Summary.

CALIFORNIA.

Alpine.

NOT ACCURATE.—"The Mountain Valley Tunnel mine of Markleeville, Cal., is sold to a San Francisco syndicate headed by C. C. Herman, the hatter; consideration, $225,000, $10,000 having been paid down." The above is from a Carson, Nev., paper. There is no Mountain Valley Tunnel mine at Markleeville, but there is a Mountain tunnel at Silver mountain. If the owners of the tunnel have made such a sale, they are in luck.

Amador.

THE ONEIDA MINE.—The *Record* is informed that at the Oneida a new shaft will be sunk to the depth of 1600 feet before crosscutting and other underground development work will begin. The old incline which was down some 1200 feet when work was stopped in 1880 will probably be cleaned out and retimbered at a later date.

Butte.

IN FORBESTOWN.—The Gold Bank mill and mine is running the tunnel and is in over 1100 feet. There is 200 feet to go before the main lead is struck at the 1000-foot level.

Calaveras.

DONALLON MINE.—H. E. Hackett, owner of the Donallon mine, expects to have his new stamp mill in operation by Feb. 1, '96.

STRIKE IN THE PURE QUILL.—From the Pure Quill mine at Angels is reported a rich strike, a five-foot shoot of ore being found which shows free gold in ribbon streaks.

BONDED.—*Chronicle:* The Maloney Ranch, near Mokelumne Hill, has been bonded to W. D. Chambers for $10,000. There are a number of quartz ledges on this property and the work of developing some of them will be commenced at once.

THE ROANOKE MINE.—At the Roanoke mine a new hoist has been put up on the Lamphear shaft and a six-inch Cornish pump put in, water for running the hoist and pump being obtained from the Mokelumne canal under 140 feet pressure. The work of cleaning out the Lamphear shaft is going steadily ahead, a depth of 145 feet having now been reached, which is about thirty-five feet from the bottom. When the shaft is cleaned and retimbered the work of sinking will be commenced, and it is calculated that with the present hoist a depth of 1000 feet can be reached if found necessary. There is a tramway 1500 feet in length leading from the Lamphear works to the mill on the Moser mine, over which it is intended to run the ore when the work of sinking is commenced. It is the intention of the company to put up an electric plant and run the ore cars over the tramway with a trolley wire. At the Moser it is 450 feet from the mouth of the tunnel to where it intersects the ledge which is 160 feet from the surface. At the end of the tunnel an excavation has been made sixteen feet wide, thirty feet high, and fifty feet in depth in which the hoist was placed. A shaft was raised 160 feet to the surface through which water is conveyed in an eleven-inch pipe to run the hoist. Work is now going steadily on in the three compartment shaft which at present has reached a depth of eighty feet below the intersection of the tunnel with the ledge. The lead in the bottom of the shaft shows exceedingly well, the ore averaging $10 per ton, while the ledge is six feet wide. There is an eight-stamp mill on the property which is run by water power under a 225-foot pressure. No concentrators are at present used in the mill, although it is intended to put in two in a very short time as the ore is now carrying extremely rich sulphurets. An addition of twelve stamps is to be made to the old mill, making twenty in all, the work of excavating for the new millsite having been commenced. Mr. W. T. Harris is superintending operations for the company. There are at present twenty-six men employed at the mine under the foremanship of W. H. Curnow.

El Dorado.

AROUND PLACERVILLE.—(Special correspondence)—C. E. Suman is reopening for W. P. Stanley and others the old Independence and Louisiana mines, twenty miles south, in the Brownsville district.

S. F. Woodworth has bonded the Harrison mine, six miles north, adjoining his own property, on which he is erecting a ten-stamp mill.

Sam Adams gave an option on property on Nigger Hill, six miles south, upon which is being erected a two-stamp mill for prospecting purposes.

Wm. O'Connor is working his seam diggings on Poverty Scratch, fifteen miles south, and taking out $2.50 to the pan.

W. P. Stanley is sinking a new shaft and removing the hoisting works at the old Toll House mine, about three miles south, with a view to reopening both mine and mill.

The Big Sandy, five miles north, owned by Toledo people and which has been idle for three years, is to be again put in active operation. Contracts have been let for sinking a new shaft and the placing of machinery. It is due Mr. F. W. Beardslee of the Lady Emma to say that, after careful examination of the property, he advised the owners to reopen the plant.

C. J. Heald of Nashville is developing the Lone Star, twelve miles south. At a depth of 100 feet the lead is six feet wide, and the ore runs $10 per ton.

Nevada.

THE COE MINE.—J. P. Meleville has bonded the Coe mine for a French and Belgic Company.

THE CADMUS MINE.—*Transcript:* The vertical shaft at the Cadmus mine is now down 100 feet. At a depth of ninety-five feet a vein two feet wide was cut.

Placer.

THE HERMAN.—At the Herman the mill is running night and day, working twenty-five or thirty men. A two weeks' cleanup recently realized $5200.

PENNSYLVANIA MINE.—*Telegraph:* The last cleanup of the Pennsylvania mine, the other day, of forty tons of ore, yielded $26 per ton. During the past two years the mine has turned out about $49,000 in gold, and that, too, with only five stamps, which run only part of the time. The ledge is now turning and the company are going to sink deeper and also contemplate putting up more substantial machinery.

DOING BETTER.—Ten men are at work at the Nevada City mine now, says the *Herald*, and we hear that the prospects are brightening. The ledge, which has a split, "makes" again, and the ore is good.

Plumas.

PLUMAS IMPERIAL.—*Independent:* Supt. McGilvary of the Plumas Imperial mine says that a monitor can be run three or four hours each day.

GREEN MOUNTAIN.—At the Green Mountain there are thirty stamps at work and preparations are being made for setting up fifteen additional.

San Diego.

NEW FINDS.—A vein of gold ore has been developed five miles southeast of Alpine. It is six feet wide and produces $10 to the ton.

A gold vein five feet wide has been discovered near Dehesa. It runs $13 per ton.

EXTENSIVE OPERATIONS.—Regarding the recent mine sales reported in these columns, the Yuma *Sentinel* says that Senator Dorsey and his associates will at once complete their plans for building a narrow-gauge railroad from the mines to the Colorado river at Picacho, four and one-half miles, and for building a 100-stamp mill, both of which will be done this winter. Senator Dorsey and Mr. Farrish are of the opinion that ore enough can be taken from the Picacho mines to constantly supply a 1000-stamp mill. Jesse R. Grant, who accompanied them, bonded thirty mines in the White Gold basin, one mile east of Picacho, which he will open at once, and to work the ores of which he will put up a 100-stamp mill on the river.

Shasta.

MOUNTAIN MINES CO.—*Courier:* Work on the Iron Mountain railroad is progressing very fast, the track being laid for a distance of four or five miles from the mouth of Spring creek, and construction trains are being run as far as Flat creek every day and night. A large force of men are still employed, probably 1500. It is estimated that over 5,000 different laborers have been employed there the past few months, many working only a week or two and quitting, their places being immediately filled by others. Many new buildings have been erected at Keswick and it now has the appearance of quite a little town. Work on the smelter is fairly under way and the company is preparing to have their electric plants in operation in a short time.

THE GLADSTONE.—Men were to work on the Gladstone this week.

THE NIAGARA.—At the Niagara about fifty men are on the payroll.

MINES BONDED.—D. B. Hunt has bonded the Tom Greene and J. I. C. mines of Mrs. M. L. Fox, et. al. These mines are two of the most promiuent in the French Gulch section.

Sierra.

GENERAL NOTES.—*Messenger:* Owing to the scarcity of water the Pioneer mine, at Grass Flat, is about to lay off a large number of men.

The Chipps mine has shut down for the winter.

In running the Sacred Mound tunnel the ledge is getting wider and prospects well.

A force of men is opening up the Bigelow tunnel.

Copeland & Wehe have closed the sale of the Northern Belle quartz mine owned by Wm. Swan.

Jas. Nohlet has several men retimbering the incline shaft at the Marguerite mine.

Siskiyou.

GENERAL NOTES.—*Journal:* Scbeld & Steele have finished building their arrastra at the claim on Long Gulch, and it will he kept busy in the future crushing their ore. As more power is required, they will have an engine.

A tunnel is being run on the old Spencer quartz mine, at north fork of Humhug, to strike the lode 400 feet deep, where it is expected a permanent ledge will be found. The work will be continued during the winter.

The hydraulic miners all along the Klamath river, since the snowstorm of last Saturday, will soon he able to commeuce operations. On the high ridges the snow ranges from one to two feet deep, and the ground in the low valley sections is covered to the extent of at least two or three inches, to afford a good supply of water, with prospects of more storms before New Years.

Lamb's quartz mill is busy this week crushing ore from the Bailey & Carrick mine on Greenhorn.

At the Boyle mine they have three men employed doing assessment work. Arrangements will probahly he made soon so this mine can he worked on an extensive scale.

Work on the Blue Gravel claim at Greenhorn, which has been closed down for a number of months past, was resumed last Saturday and will he continued all winter. It will take several days to pump the water out of the mine, after which a day and night force will he kept constantly at work. There will be ahout eight men on each shift.

Tuolumne.

GENERAL NOTES.—*Independent:* A ten-stamp mill will soon he erected at the Louisiana mine.

The new twenty-stamp mill at the App is nearing completion.

The Golden Gate mine was shut down this week for lack of water for power.

On Sunday the new machinery at the Star mine was set in motion for the first time and worked in a highly satisfactory manner. On Monday the new ten-stamp mill commenced crushing ore. It is a first-class mill and can be run by either steam or water power.

THE LOUISIANA.—*Banner:* Lumber is being delivered at the Louisiana mine, hetween Cherokee and Soulsbyville, for a ten-stamp mill. At present the battery will consist of five stamps. The shaft is down 360 feet at the bottom; there is a vein from twelve to sixty inches. W. A. Hall is manager of the property.

Yuba.

THE OLD TEMPLAR MINE.—J. E. Poingdestre and others of Nevada City are developing the old Templar mine, now called the Goodtitle, which is located in Yuba county, about three miles from Dobbins' ranch. This mine was worked about fifteen years ago, and considerable gold was extracted from it. But it was abandoned, like many old California mines that have since turned out good.

NEVADA.

THE OPHIR.—At the annual meeting Supt. Lyman reported that they have on hand in the ore house 193 tons of ore, the average assay value of which, per sample taken from the cars when raised to the surface, was $29.49 per ton. On the 250 level, which is worked through the central tunnel, they estimate they have stored in the drifts 120 tons of ore, the average assay value of which, per sample taken from the cars in the mine, was $39.58 per ton. This makes a total of 313 tons, averaging $33.35 per ton. Arrangements will soon be made to heneficiate this ore. As it is impregnated with some lead and some other base materials, it is proposed to have it crushed and concentrated and to ship concentrates to some suitable reduction works for extraction of the gold and silver contained in them.

Three years ago, when they were extracting ore from the 1465 level, there was saved 439 tons of ore of low grade, and it was hoisted from the mine and stored on the waste dump separate from the waste rock. This ore assayed from $8 to $12 per ton and was sold the past year for 50 cents per ton.

SAVAGE.—On the 950 level, in west crosscut 1, at a point 20 feet back from the face, they have started a north drift to prospect the quartz body passed through in the west crosscut, and advanced the same 25 feet in quartz of a low assay value. The west crosscut started in the north upraise is advanced 40 feet, passing through some streaks of fair grade ore; face in ore. The north upraise was advanced 7 feet, making its total length 65 feet. The east crosscut started in the north drift 85 feet north of the north upraise was advanced 38 feet, when it reached the east clay of ledge and was discontinued. Have also started an east crosscut in the north drift from the fourth floor of the north upraise at a point 40 feet north of the upraise, and same 10 feet; face in porphyry and quartz. They are doing some repair work throughout the mine. No ore has been hoisted during the week.

BEST & BELCHER.—800 level—East crosscut 3, started at a point in the main north drift, 360 feet from our south boundary, was advanced 6 feet; total length, 256 feet; face in hard porphyry.

We are still doing some necessary repairing on the 400 level.

In the Hale & Norcross mine on the 975 level the ore streak which they are stoping upon in upraises 1 and 2 continues to look the same as last reported. They extracted from the various openings during the last week 34 carloads of ore, the average assay value of which was $85.55 per ton.

In the Chollar mine, from the stopes above the 450 level, they extracted and shipped to the Nevada mill during the week 64 tons and 500 pounds of ore, the average battery sample of which assayed $30.65 per ton.

The yield of the Potosi mine for the week was 155 tons and 1100 pounds of ore from the stopes above the 550 level. The average battery assay was $25.94 per ton.

In the Alpha Con. mine the southwest drift from the west crosscut, 450 level, has been advanced 12 feet; total length, 42 feet. The face is in quartz, assaying $3 to $15 per ton. The raise in the southwest drift has been carried up 7 feet; total height, 24 feet. The roof is in quartz and porphyry, the quartz assaying $2.50 to $10 per ton. Work was suspended in this raise on account of tapping a stream of water, and as soon as the flow decreases, work will he resumed. Have started a north drift opposite the southwest drift in the ledge and advanced the same through quartz assaying $5 to $20 per ton. The face is in quartz.

BRUNSWICK LODE.—Shaft 1 on Hale & Norcross ground near the Chollar Company's north boundary has been sunk a distance of 18 feet on the incline, passing through porphyry, clay and quartz showing some value; total depth, 245 feet.

Shaft 2 on the boundary of the Con. California & Virginia and Best & Belcher Companies' grounds has been sunk 12 feet on the incline, passing through hard porphyry; total depth, 166 feet.

East crosscut 1 in Savage Company's tunnel, which was started at a point 400 feet from the mouth of the tunnel, has been extended 8 feet, passing through hard porphyry; total length, 142 feet. Work has been discontinued in this crosscut.

A west crosscut has been started from a point opposite where the east crosscut was started, and the same has been advanced 18 feet, passing through hard porphyry and quartz.

In the Occidental Consolidated mine, on the 550 level, the southwest drift is now in 128 feet. The face is a softer formation with seams of quartz carrying gold. 650 level—The north drift from northwest crosscut has been extended 12 feet; total length, 45 feet, and continues in ore of low grade. The upraise started in north drift is up 18 feet and is in ore assaying $17 per ton. The south drift from crosscut has been extended 12 feet through ore of fair quality. 750 level—The west crosscut from north drift, 310 feet north of the main winze, has been cleaned out 45 feet and has been advanced 3 feet in new ground; total length, 48 feet.

READY TO BEGIN.—*Enterprise:* The Kinkead Mining, Milling and Manufacturing Company, which is erecting a plant to work over the C. & C. waste dump, is about ready to commence operations. In two or three days their mill will commence a run on the stored ore which has already been extracted from the dump. The ore will be taken in at the top of the building and dumped into an ore bin of the capacity of 100 tons; thence it will be carried by the aid of self-feeders into the grinders. It is then discharged from the grinders through a forty-inch screen to the plates. From the plates it goes into the point boxes, the surplus water is discharged and the pulp carried out to the concentrators.

LINCOLN COUNTY.

THE APRIL FOOL MINE.—Work on the April Fool pipe line is progressing, water will flow through the pipe by February 1, 1896, says the De Lamar *Lode*. The company is now negotiating for a mill and negotiations will be concluded in the next thirty days. The upper and middle tunnels are being driven ahead.

OREGON.

SISKIYOU MINING CO.—From Capt. Geo. F. Wheeler, of the Siskiyou Mining Company, the *Mining Journal* learns that nothing will be done this winter in the matter of constructing a road to the coast from the copper mines, but the energies of the company will be bent towards getting out, reducing its copper ores and shipping its copper. A temporary arrangement has been made with the S. P. R. R. Co. whereby the copper will be shipped by rail to Galveston, and thence by water to New York, whence it will be transported to Baltimore where the Baltimore Copper Co. will handle it.

JOSEPHINE COUNTY.

MINE BONDED.—G. F. Wheeler, A. M. Brown and J. H. Simon have a bond on the Mountain Pride mining claim, located on the Yank ledge on Rogue river, near the mouth of Galice creek, for $30,000.

THE MAYBELLE.—G. A. Koch tells the *Mining Journal* that at the mines of the Maybelle Mining Company at the Gold Basin there are thirty men employed. About fifty animals are still used on the trail in packing. The men are busy building a five-foot flume about 1200 feet in length and sixty feet high, which, it is estimated, will furnish sufficient water for four giants, with a pressure of 125 feet. Next year it is contemplated to build twelve miles of additional flume, at a cost of about $15,000. Mr. Koch is of the opinion that the Gold Basin is a glacial wash deposited at three different periods. The surface for a distance of sixteen feet consists of a red gravel which is very rich in gold. Below this is a blue-gray gravel, not quite so rich on the whole, but containing rich streaks, and rich enough to pay well for working. Below this, again, and on the soft granite bed-rock lies the richest deposit of gravel. The total depth of the gravel is over 100 feet in the 300 acres embraced in the Basin. In about thirty days the work will be so far completed that piping can be commenced.

WASHINGTON.

SPECTACLE LAKE DISTRICT.—The Spectacle lake district, in Okanogan county, is attracting considerable attention and a large amount of development work is being done. On the Iron King the shaft is down thirty-five feet, and it is the intention to sink fifteen feet farther and crosscut to the hanging wall. The Jack Rabbit is showing up ore similar in character to that of the Iron King, assays from the surface showing it is said, value of $45 in gold and nickel.

BRITISH COLUMBIA.

RAWHIDING WILL SOON BEGIN.—Nelson *Tribune:* The snow falls of last week have made rawhiding possible in Slocan district, and in various directions animals are being taken to the mines. The Goodenough has two carloads ready for shipment, which will be sent to the smelter at Pilot Bay. On the south fork of Kaslo creek the owners of the Gibson will bring down a carload, which will also go to Pilot Bay. The Slocan Boy will also ship at an early day. The large properties will also rush forward to an early market the output of several months.

REDUCTION WORKS FOR CARIBOO.—Cyanide reduction works, so it is reported, are to be erected on the Black Jack mine, near Barkerville, in Cariboo. The ore in that mine is of good grade, hut too rebellious to work profitably by free milling processes.

GENERAL MINING NOTES.—Rossland *Miner:* The Le Roi is raising 100 tons a day and there are not wagons enough to haul it.

On the Cliff, after following a false vein, a narrow seam on the side of the drift was followed, and found to open into a good body of clean ore, running from fifteen to twenty per cent copper, $21 in gold, making a total value of $45 a ton.

The dispute about the Homestake is cleared away, and D. M. Linnard, acting for Vancouver parties who have a bond, has let a contract for hunk houses and for a road to connect with the existing wagon road. Double shifts have been put on at the shafts and ore will be shipped by the end of December. Last assays gave $12 in gold and nineteen ounces silver.

New Denver *Ledge:* Ten men are working on the Kalispel, Ten Mile creek.

The C. P. R. is giving carload rates for ten-ton shipments of ore from Rosebery to the coast smelters.

Midway *Advance:* Fourteen locations were recorded at Midway for the week ending Nov. 27th.

A force of men will he put on the Knob Hill and Old Ironsides, Greenwood camp.

On the Cariboo mine, Camp McKinney, twenty-five men are engaged, and some of

the best ore yet obtained is being run through the mill.

Mining Journal: The Underwood dredger at Quesnelle is ready for work. Mr. Youngs, of Pittsburg, is arranging to build another.

The large dredger on the Fraser river at Lytton is likely to start up soon. The small dredger of the Finch company has been doing well on Mormon Bar.

Mr. Clemes, the London mining expert, and Mr. Fraser, manager of the Bank of Montreal at New Westminster, have been from Big Bar to the mouth of the Chilcotin. They favor the building of a dredger.

Since the pump has been put in on the Vancouver, Lillooet, no difficulty has been experienced with water, and the shaft is down seventy feet and in wash gravel, and the men anticipate reaching bedrock soon. From the the bottom of the shaft a drift will be made to the Basin.

J. B. Hobson is on his way down from the Horse Fly. About $110,000 has been taken out this year, and it is not anticipated that the shareholders will be required to put up any more money, though this mine and the Cariboo will not be properly opened for a year or two longer.

Fort Steele *Prospector:* The Dibble group has been bonded by Wm. Sprague and Thos. Chisholm for $25,000 for one year, $5,000 in work to be done during that time. The ore being taken from the North Star runs 265 ounces in silver.

In the Moyea group Jas. Cronan is taking out ore running fifty-four ounces in silver and sixty-five per cent lead on the St. Eugene. About fifteen men are employed. On the Queen of the Hills and Moyea a tunnel has been run striking the ledge, which assays the same as the St. Eugene. Both the St. Eugene and St. Patrick, owned by one party, and the Lake Shore, Moyea and Queen of the Hills, owned by another, will have ore to ship next summer if communication can be had.

The Invicta Gold Mines, Ltd., has a property consisting of about a mile and a half of hill diggings on Wild Horse creek. There are feet of top loose gravel, thirty feet of red gravel, and forty feet of blue cement, all containing gold. Three ditches, about five miles long, convey 1,500 inches by which three monitors are worked, but larger ones will be used next summer. Nuggets from $5 to $10 are common, and one was got during the past summer weighing eight and one-half ounces and valued at $150. The estimated returns of past years have been $50,000.

ALASKA.

GENERAL NOTES.—*News*, Dec. 5: The Mexican mine is now using steam power instead of water on account of the shortage of the latter.

The rails for the extension of the Treadwell railroad to the Ready Bullion arrived on the Al-Ki. Work will be begun in a few days laying the iron.

The scarcity of water at Treadwell's has necessitated the closing down of the compressor, thereby laying off a number of men for a short time.

C. W. Garside is surveying on the Takou group of claims recently bought by W. Ebner and will run a line for a new tramway. Development work will continue on this group of claims all winter. A tunnel is to be driven which will tap the veins at a much lower depth than that which is now being worked.

The tunnel on the 400-foot claim between Treadwell's and the Mexican is now in 190 feet. A track will be put down the latter part of the week and tram cars will succeed the wheelbarrows formerly used. The tunnel will be driven fully 1,000 feet farther before the vein is tapped.

Work on the old Bennett mine, the Aurora, has ceased for the winter. Since E. S. Holden began operations, buying the ore from Lutes & Bonnifield and milling it in the small Ebner mill, the success of the property has been marked.

UTAH.

PARK DISTRICT.

A GOOD SHOWING.—*Record:* There has been mined and shipped from the camp in '95 to date ores, including Crescent shipments, to the amount of 92,507,169 pounds; reduced to tons, gives over 46,252 short tons. The rate on ore from Park City to Denver is $7 per ton, and to Salt Lake $2; hence, considering the manner in which ore is divided, an average figure would be $6 per ton on all rock handled. That would give the railroads a business amounting to $277,512 on one class of freight alone, to say nothing of the coal, timbers, machinery and merchandise of all kinds that go to make up the necessary supplies for a mining camp. For dull times we consider the showing a very good one.

WORTH A MILLION.—The suit of the Marian Gold and Silver Mining Co. against M. T. Gishorn, involving the title to certain mining claims in the Camp Floyd district, valued at about $1,000,000, was decided by Judge Merritt at Salt Lake this week in favor of Gisborn.

IDAHO.

NEAR WANETA.—S. W. Cowan, of the Kootenay Water Supply Company, speaking of the operations of his company on the Pend d'Oreille river, near Waneta, and adjacent country says: "We have taken out of the Pend d'Oreille river 2000 horse power by constructing a wing dam at Seven Mile creek, seven miles from the Columbia river, and have constructed south of the falls on Seven Mile creek a flume seventeen feet square and are now placing three fifty-four-inch Leffel wheels and three rotary pumps with a capacity of 12,000 gallons a minute. The purpose of this work is to put 20,000,000 gallons of water on 1100 acres of placer ground on the north side of the Pend d'Oreille. The mining operations will be conducted under a twenty-one-foot head ninety-foot pressure, and three giants will be used—one five-inch, one four-inch and one two and a half inches, and it is expected that the work of hydraulicking will commence by the 15th of March. We have spent $10,000 in thoroughly prospecting the ground and from the best expert opinion the ground will yield twenty-five cents per cubic yard. The cost of washing the gravel will not exceed two to three cents." The manager is G. J. Goodbue. At present the offices are in Rochester, N. Y., but will shortly be removed to New York City.

A BIG PLACER DEAL.—In the Cariboo district, Bingham county, the American Placer Company has sold its bars to Thomas & Sons of Chicago for $300,000. The bars have been worked for some time. Thomas and Sons' output was $40,000. The ground averages about seventy-five cents a cubic yard. In the same district the Oneida and Nealon quartz mines have been sold to Colorado men for $90,000. Eight gold-bearing quartz claims, the average value of the ore of which is only $8 a ton, have been bonded to Chicago men for $150,000.

SOUTH DAKOTA.

NEW CORPORATION.—*Journal:* Articles of incorporation were filed at Pierre on Tuesday last, for the Holy Terror Mining Company and the Milwaukee Mining and Milling Company, the former with a capital stock of $300,000 and the latter at $100,000, at shares of $1 each. Headquarters for each company are at Milwaukee, Wis., and Keystone, S. D. The incorporators are J. S. George, C. M. Kipp, Milwaukee; and J. J. Fayel, Keystone.

COLORADO.

"QUEER THINGS IN CRIPPLE CREEK."—*Mail:* If you are not a guest at the hotel you are charged fifty cents for the use of a chair for a few minutes.

Barber chairs are converted into beds at night and bring from 75 cents to $1.50 each per night.

Pasteboard houses costing about $15 rent for $20 per month.

Miners and millionaires hobnob together.

Ore thieves, who work as miners, often carry away from $10 to $100 per day in their dinner pails.

People are walking the streets night and day because they can find neither place to rest or sleep.

Jim Crow men are passing themselves off as mining experts.

THE NEWTON COMPANY ASSIGNS.—The Newton Milling and Sampling Company of Idaho Springs made an assignment last week to John G. Ogden for the benefit of the creditors of the company. The assets are given at $9,938.09. The liabilities are placed at $8,617.08.

ARIZONA.

THE CEDAR VALLEY CO.—*Oasis:* The Cedar Valley Gold and Silver Mining Company, operating in Mojave county, about eighty miles from Kingman, near the Big Sandy river, are doing much to develop the mining resources of that county. In their mines at Cedar they have ninety men at work, and with a force of 100 men they are building a good road over the mountains to connect with the county road to Yucca, a station on the Atlantic & Pacific railroad, which place will be their railroad headquarters. The mine is now and has been for some time producing a rich gold and silver ore from a well defined, continuous vein. The ore is being hunched at the mine to await the erection of a large mill by the company which will be brought in just as soon as the road is completed. This company is composed of wealthy Pennsylvania gentlemen.

PROPERTY BONDED.—John Brockman of Silver City, N. M., has an option on the Pearce group of mines, near Tombstone, till January 1st, '96. The price agreed upon is locally said to be $500,000. These mines, six in number, were located last February. The owners commenced the work of development and the shipment of ore at once, and have continued steadily working and shipping ever since. The ore in places runs very high; the average, however, is 80 ounces in silver and 1 ounce in gold. The average width of the ledge is 40 feet. The shaft is down to a depth of 50 feet and there are two drifts running in opposite directions of 60 feet each.

MICHIGAN.

COPPER MINES AND DIVIDENDS.—The Calumet & Hecla Co. paid a dividend of $5 per share, on the 18th. This is the fourth dividend of $5 this year, and brings the total dividends up to $44,350,000. The Calumet & Hecla's October output was the largest in its history, being about 9,000,000 pounds of refined copper. This represents the amount smelted during the month.

At the Tamarack Mining Co. the output of stamp rock is returned at about 1400 tons a day, and the production of refined copper now approximates 1,500,000 pounds per month. The depth in feet of the several shafts is as follows, viz.: No. 1, about 3000; No. 2, 3500; No. 3, 4300; and No. 4, 5500. The new No. 5 shaft is now down 75 feet, and it is not expected to be completed until the year 1900. The width of vein rock in each shaft is said to be from 20 to 26 feet. The Tamarack has paid in dividends $4,470,000, including one of $4 per share or $200,000, to be dishursed on the 31st inst.

The Quincy Mining Co. has sunk shafts Nos. 2 and 4 about 3800 feet, and No. 6 about 3500 feet. The character of the vein in each shaft is the same as heretofore, and with five heads of stamps employed the company produced in October 850 tons of mineral, or about 1,344,000 pounds copper. The Quincy produced in 1894 15,484,014 pounds of refined copper, and the production of 1895 will not show any very pronounced increase. The company has paid in dividends this year $600,000, making a total of $7,670,000 since its organization. Since the beginning of operations at this mine to date the total output of refined copper is close in the neighborhood of 180,000,000 pounds, valued at about $28,305,428, including silver, allowing only 10 cents per pound for the last eleven months' production. The paid-in capital stock amounts to $200,000, and the company has expended on real estate, improvements, machinery, plant, etc, over two million and a quarter dollars.

Two Worthy Measures.

The following, furnished by Chairman T. L. Ford, of the Legislative Committee of the California Miners' Association, are two measures that will shortly be introduced in Congress, and which deserve the hearty support of every one in the State directly or indirectly interested in mining:

A BILL TO AMEND CHAPTER SIX, OF TITLE THIRTY-TWO, OF THE REVISED STATUTES, RELATING TO MINERAL LANDS AND MINING RESOURCES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

SECTION 1. That section twenty-three hundred and twenty-four of the Revised Statutes be amended so that the same shall read as follows:

"SEC. 2324. Miners of each mining district may make regulations not in conflict with the laws of the United States, or with the laws of the State or Territory in which it is situated, governing the location, manner of recording, amount of work necessary to hold possession of a mining claim, subject to the following requirements: The location must be distinctly marked on the ground so that its boundaries can be readily traced. such marking to include one post or monument at each corner of the claim. All records of mining claims hereafter made shall contain the name or names of the locators, the date of the location, and such description of the claim or claims located by reference to some natural object or permanent monument as will identify the claim. On each claim located, and until payment of the purchase money and a certificate of entry has been issued therefor, not less than $100 worth of labor shall be performed or improvements made during each year.

"Where such claims are held in common, such expenditures may be made upon any one claim by any work or improvements tending to develop any of such claims. The period within which the work required to be done annually on mineral claims is to be performed shall commence at 12 o'clock meridian on the first day of January succeeding the day of location of such claim.

"When the labor required by this Act shall have been performed, or the improvements made, an affidavit may be filed within thirty days after the time limited for the performance of such labor, or making of such improvements, with the Recorder of Deeds in the county in which the claim or mine is situated, particularly describing the labor performed, and the improvements made, and the value thereof, which affidavit shall be *prima facie* evidence of the facts therein stated; and upon a failure to comply with the conditions of this Act, in the performance of labor or the making of improvements, the claim or mine upon which such failure occurred shall be open to relocation in the same manner as if no location had ever been made; provided, that the original locators, their heirs, assigns or legal representatives, do not resume work upon the claim after such failure, and before such relocation, and continue the same with reasonable diligence until the required amount of labor shall have been performed or improvements made. Upon the failure of any one of several co-owners to contribute his proportion of the expenditure required hereby, the co-owners who have performed the labor or made the improvements may, at the expiration of the year, give such delinquent co-owner personal notice in writing, or notice by publication in the newspaper published nearest the claim, for at least once a week for ninety days, and if at the expiration of ninety days after such notice in writing, or by publication, such delinquent shall fail or refuse to contribute his proportion of the expenditure required by this section, his interest in the claim shall become the property of his co-owners who have made the required expenditure. A copy of such notice, together with an affidavit showing personal service or publication, as the case may be, of such notice, when filed and recorded with the Recorder of Deeds in the county in which such mining claim is situated, shall be *prima facie* evidence of the acquisition of title of such co-owners. Where a person or company has run or may run a tunnel, or constructed roads or trails, for the purpose of developing a claim or claims owned by said person or company, the money so expended in running said tunnel or constructing said roads or trails shall be taken and considered as expended on said claim or claims; provided, further, that said claim or claims shall be distinctly marked on the surface, as provided in this Act."

SEC. 2. That section twenty-three hundred and twenty-four of the Revised Statutes be amended by adding thereto the following:

"And the surveyors appointed under the provisions of this section shall have power to administer oaths to their assistants."

SEC. 3. That section twenty-three hundred and thirty-five of the Revised Statutes be amended so as to read as follows:

"SEC. 2335. All affidavits required to be made under this chapter may be verified before any officer authorized to administer oaths in the State or Territory where the claims may be situated, having an official seal, and all testimony and proofs may be taken before any such officer, and when duly certified by the officer taking the same, attested by his seal of office, shall have the same force and effect as if taken before the Register and Receiver of the Land Office. Whenever any contest shall arise as to the mineral character of any land claimed to be subject to entry or sale under an Act of Congress, all proceedings shall be stayed until the controversy shall have been settled or determined by a court of competent jurisdiction in the county where such land is situated, or the contest withdrawn; and it shall be the duty of the Register of the Land Office in which such contest is made to immediately certify such contest to such court, and to immediately notify the contestant and contestee thereof.

Within thirty days after filing such contest, the contestant shall file in such court a verified statement of the facts upon which he bases his contest, in plain and concise language, and shall serve the same upon the contestee; and thereafter, and within the time provided by the laws of the State or Territory where such land is situated, for answering in any civil action, the contestee shall file his verified answer to such statement, and thereupon the contest shall be tried and determined as are ordinary actions in such court; and, when determined, such determination shall be certified to the Register, and such determination shall be binding upon him, and shall be forever conclusive as to the character of the land in question; provided, that the presence of rock, earth or gravel, bearing gold, silver, cinnabar, petroleum or other valuable mineral, shall be regarded as *prima facie* evidence that the land containing the same is mineral in character; and provided, further, that in investigating the character of land with a view to ascertaining whether it is more valuable for mineral than for agricultural purposes, evidence may be taken of the mineral discovered or developed adjacent to such land, proof of which shall be taken as presumptive evidence that the land in question is mineral in character; and provided, further, that wherever land is proven to be within a well-defined mineral belt, such land shall be deemed, presumed and taken to be mineral land, unless the contrary is proven; and provided, further, that the provisions of this chapter shall be liberally construed, with a view to aid the applicant in procuring title to the mineral lands of the United States, and that the rules and regulations prescribed by the Land Department for its government and that of its officers, in disposing of said lands, shall be so formulated and administered as to assist the Government in disposing of said lands to *bona fide* applicants; and provided, further, that all applicants for patent for lands, upon which exists a valid mining location, the notice of location of which, designating the section and township in which such location is situated, shall have been recorded in the office of the Recorder of Deeds of the county wherein the land in question is situated, must, except when otherwise in this act provided, give to such mineral claimant notice of such application in writing, or by publication in the newspaper published nearest such mining location, at least once a week for sixty days."

SEC. 4. That Section twenty-three hundred and thirty-seven of the Revised Statutes be amended so as to read:

"SEC. 2337. Where non-mineral land not included in a lode claim is used or occupied, or is intended to be used or occupied, by the proprietor of such vein or lode claim for mining or mineral purposes, such non-mineral surface ground may be embraced and included in an application for a patent for such vein or lode claim, and the same may be patented therewith or separately, subject to the same preliminary requirements as to survey and notice as are applicable to vein or lode claims; but no location hereafter made of such non-mineral land shall exceed ten acres, and payment for the same must be made at the same rate as fixed by this chapter for the superfices of the lode claim. The owner of a quartz mill or reduction works, not owning a mine in connection therewith, may also receive a patent for his mill site as provided in this chapter."

A BILL TO APPROPRIATE MONEY FOR THE CONSTRUCTION OF WORKS TO IMPOUND MINING DEBRIS, AND THEREBY TO PROTECT THE NAVIGABLE STREAMS OF CALIFORNIA.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress Assembled.

SECTION 1. That there is hereby appropriated out of any money in the treasury not otherwise appropriated the sum of one million and thirty thousand dollars, which sum shall be immediately available and shall be expended under the direction of the Secretary of War, in accordance with the plans, specifications and recommendations of the California Debris Commission, appointed under the Act of Congress entitled, "An Act to create the California Debris Commission and regulate hydraulic mining in the State of California," approved March 1, 1893, for the purpose of constructing works for the restraining and impounding of mining debris upon the tributaries of the Sacramento and San Joaquin rivers in California and the branches of such tributaries.

SEC. 2. Whenever any such works for the restraining and impounding of mining debris shall have been constructed out of such appropriation, or shall have reached such a stage as, in the opinion of such commission, it shall be safe to use the same, it shall be lawful for such commission to make the order provided for in section 13 of said act, upon proceedings being first had and taken in accordance with the provisions of sections 9, 11 and 12 of said act, but in such cases the owners of the mines affected by said orders shall not be bound by the proviso to said section 13 of said act nor by the provisions contained in section 16 thereof.

SEC. 3. The said commission shall also have the power to make the order provided for in section 13 of said act as to any mine or mines whenever it shall appear to the satisfaction of said commission that no impounding works are necessary other than the means already provided by nature to protect from material injury the navigable streams mentioned in said act and the land adjacent thereto, upon proceedings had in accordance with sections 9, 10 and 12 of said act.

Coast Industrial Notes.

—Building permits for '95 in Los Angeles aggregate nearly $4,000,000.

—Kimball, Phillips & Malot, of San Diego, have given a sixty days' option on the Verde antique marble property to Alameda properties for $225,000.

—Colonel Charles F. Crocker is going to start a coffee plantation in the San Joaquin valley. The San Juan brought from Central America 1000 yearling plants, which will he set out this fall.

—Last Monday's edition of the Oakland, Cal., *Daily Times* was a splendidly illustrated one, making a fine showing of the industries and attractions of the city fortunate enough to have so enterprising an exponent.

—The Minneapolis Trust Company has bought a controlling interest in the Seattle, Wash., Gas and Electric Light Company. The company has a capital stock of $600,000 and a bonded indebtedness of $750,000, the Minneapolis Trust Company being the holder of about $400,000 of the bonds.

—The price of beets at the Chino sugar factory for '96 is on a basis of $3 per ton, with an additional 25 cents for each percentage of sugar contained in the beets above 12 per cent. This year the average price paid for all beets was 80 cents a ton above the basis price, or $4.30 a ton. The same percentage of sugar with the '96 basis would make the price $3.80 a ton.

—For the first eleven months of '95 flour exports from San Francisco aggregated 859,500 barrels, against 706,270 barrels during the same period in 1894. Putting this on a wheat basis, and adding it to the exported wheat, gives total exports of wheat during the eleven months of 12,600,100 ctls., valued at $11,891,200, against 8,583,300 ctls. at $8,133,400 during the same time in 1894.

—The arrival in London is noted of a large consignment of frozen salmon from British Columbia, in good condition and of excellent flavor, notwithstanding the fact that they were taken months ago and were sent to London via Australia, a distance of something like 22,000 miles. It is believed that the cost of importing frozen salmon into England is too heavy to allow of the fish to he sold at a sufficiently low figure to eommand general sale.

—A well-known Portland merchant has recently had illustrated to him, in the persons of two commercial travelers, great vicissitudes of fortunes. One, who called to solicit trade for a certain hrand of catsup, was at one time one of the leading merchants of Boston, and his residence, when adversity came, sold under the hammer for $73,000. The other, who had a line of cigars, had heen twice elected Governor of one of the largest Western States.

—The scheme to huild an all-rail route through British Columbia into Alaska is again heing discussed. This time it is to go hy way of Kamloops, the North Thompson and Barkerville, through the heart of Carlhoo. The distance to Barkerville from Kamloops is ahout 350 miles. Such a line would he of advantage. But if such a road is to he huilt it will he hy the Canadian Pacific Railway Company, for the construction of which line a charter is already held.

—The new Howe truss hridge spanning the Sacramento river eontains 1,100,000 feet of lumher, and cost for lahor and material $130,000. The hridge consists of four spans and a draw. Three of these spans are each 150 feet long, one is 125 feet, and the draw is 236 feet. The latter will he operated hy an electric motor with automatic gates for the roadway, which gates will open or close as the draw is moved. It will also he equipped with hand machinery, to he used in case of accident to the automatic apparatus.

—The Pacific Mail Steamship Co. and the Panama Railroad Co. have come to a traffic agreement which insures a continuous line hetween New York and this city, the steamers on the Atlantic side to he run hy the Panama Railroad Co. and those on this side owned and operated hy the Pacific Mail, which last company has the monopoly of waterway traffic on the Pacific side; the Pacific Mail gets 45% of the through traffic, the Panama railroad 45%. The Pacific Mail's three Atlantic steamers will he brought round the Horn.

—The California Oil and Transportation Company is organizing in Los Angeles hy law to purchase from Charles Nelson of this city the lumher harge, Enoch Talbot, and, with that hoat as a nucleus, organize a line of oil steamers for coast transportation. It is the intention to huild a 12,000-harrel tank at the San Pedro wharf for the storage of oil until it can he loaded on the harge. The objective point will he San Francisco. The company has no business connection with the Oil Exchange, though some of the members of the Exchauge are interested in it.

—The flour combine includes, under the name of the "Sperry Flour Company," the following mills: The Pioneer mill, Sacramento (ruuning); the Sacramento (closed); mill at Sheridan, Placer Co. (closed); Wheatland mill (closed); Buckeye mill, Marysville (ruuing; Gridley, Butte Co., mill (closed); mill at Chico (running); two mills at Stockton, including the Sperry (running); Golden Gate mills, this city (closed). The Sperry Company's mills also include those of the Central Milling Company, extendiug over the central and southern part of the State. The chief result of the combination has heen the retention of the China trade.

—Secretary of the Navy Herhert will award the construction of one of the two new hattleships to the Union Iron Works of this city, the recent hid to he modified. That hid was for $2,640,000; the Cramps of Philadelphia hid $2,750,000; the Newport News Shipbuilding Co, hid $2,250,000. The Government recognizes the advisahility of constructing one of the vessels here, and proposes that the plans and price he modified; the result will undoubtedly be that the compromise will he made, the plans changed to conform to all conditions, the price modified proportionately and the contract awarded to the local firm in final accordance with the act of Congress authorizing the expenditure.

Personal.

JAS. TREADWELL is examining mining properties in Amador Co.

C. B. WINGATE, of the Thistle mine, Sierra Co., has returned to Scotland.

JOHN MCMURRY, of Trinity, left for Washington via Kentucky, last Sunday.

H. BANKERT has been appointed manager of the Promontorie mine, Durango, Mexico.

R. C. CHAMBERS has heen elected president of Salt Lake Utah's, first Mining Exchange.

W. C. MCCOY, of Auhurn is now superintendent of the Hasskell or Gaylord gravel mine.

G. M. ROBERTS, chief assayer at the Broken Hill Proprietary (Australia), has resigned and will go to Coolgardie.

J. H. TIBBETTS arrived at Buluwayo, Mataheleland, South Africa, on the 9th inst. One word wired from there costs $3.80.

SUPERINTENDENT SMITH, of the Bonanza mine, Sierra Co., has assumed the superintendency of a Cripple Creek, Col., property.

A. H. ROLLINS and George Marks, representing the Copper Queen Co. of Arizona, are examining properties in Skagit Co., Wash.

MR. PAUL JOHNSON, superintendent of the Hall mines, Nelson, B. C., says the fires will be lighted in the smelter on the 1st of January.

F. W. EDELSTEN, editor and proprietor of *The Bullion*, is here, and reports considerahle life in the mining industry in southern California.

C. A. MONKOVSKY, a Russian mining and railroad engineer, is iu the State securing mining statistics and information for his Government.

FRANKLIN LEONARD, of New York, president of the Comstock Tunnel Co., was in the city during the week, and says he will winter on the Comstock.

HERBERT BARTLETT, the Washington State expert has heen exploring Nehraska and declares the discovery of gravel elaims there "fahulously rich in gold."

"BARNEY BARNATO, the Kaffir King," is announced to shortly visit Colorado, where, it is helieved, should he desire to invest in mines, no local objection would he sustained.

HON. T. L. FORD of this city has heen selected hy the Executive Committee of the Miners' Association to go to Washington in the interest of necessary national legislation.

MAJOR FRANK MCLAUGHLIN, of Butte Co., has sold to his English associates all his interests in the River Claim, Butterfly, Banner, Mineral Slide, and Rock River in that county, and will take a well-earned rest, prior to the development of other projects.

A Question Answered.

TO THE EDITOR:—In last week's issue you have an article on assessment work. It is clear to me, hut I have some friends who are placer mining (they have eight claims—160 acres), and say that the only assessment required is $100 for the whole 160 acres. Should it not he $800 worth of work—either $100 on each claim or $800 on one, if for henefit of others? By answering this through your valuable paper, you will greatly ohlige

Fresno, Cal., Dec. 16, '95. A SUBSCRIBER.

[Work or improvement to the value of $100 is required on each claim. If, in the case specified, the whole $800, in such work or improvement, can he proved to he for the joint henefit or development or working of the entire group of eight claims, the amount ($800) can he expended on any one of those aggregated claims. In all such cases there must he $100 expended for each 20-acre claim.]

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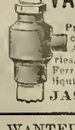
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For the half year ending with the 31st of December, 1895, a dividend has been declared at the rate per annum of four and thirty-two one-hundredths (4 32-100) per cent on term deposits, and three and six-tenths (3 6-10) per cent on ordinary deposits, free of taxes; payable on and after Thursday, the 2nd day of January, 1896.

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Annual Mining Company Meetings.

At the annual meeting of the Mount Diablo Mill and Mining Company 39,132 of the 50,000 shares of the capital stock were represented, and J. M. Shotwell, J. N. Knowles, Louis Tesse Jr., John Tunningsen and R. W. Heath were elected directors. J. M. Shotwell was elected president and R. W. Heath secretary. The company has a cash balance of $1599.49 in the bank.

At the annual meeting of the Andes Mining Company 81,395 shares were represented, and the following officers elected: President, Nat T. Messer; vice-president, Gus E. L. Parker; directors, W. S. Lyle, W. Edwards and H. Zadig. John W. Twiggs was re-elected secretary and Joseph Ryan superiutendent. The secretary's financial statement showed a credit of $3727.12.

At the annual meeting of the Kentuck Mining Company, 70,128 shares were represented, and the following officers elected: President, R. E. Kelly; vice-president, H. Zadig; directors, S. Jacobs, W. H. H. Hart and Aug. Waterman. Aug. Waterman was re-elected secretary, and his financial statement showed a credit of $4364.94.

At the annual meeting of the Ophir Mining Company, 66,788 shares were represented, and the following officers elected: President, Charles H. Fish; vice-president, Nat T. Messer; directors, George B. Wells, A. W. Havens, John W. Twiggs, H. Zadig and Charles Hirshfeld. E. B. Holmes was re-elected secretary, and D. B. Lyman superintendent. The secretary's financial statement showed a credit of $11,722.37.

The Gould & Curry Mining Company, at its annual meeting, re-eleeted the old directors, with Henry B. Havens as president; Charles H. Fish, vice-president; A. K. Durhrow, secretary; Patrick Kervin, superintendent; and the Nevada Bank, treasurer. The numher of shares represented was 80,115. The company has an indehtedness of $781, with an assessment of 15c per share in process of collection. A resolution authorizing the superintendent to dispose of the old maehinery at the mouth of the Osbiston shaft was adopted.

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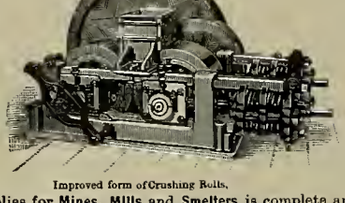
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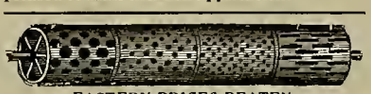
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References:
Timothy Dwight, President Yale University, New Haven, Conn.
Henry S. Munroe, Professor, School of Mines, Columbia University, New York City.
Joseph S. Harris, President Phila. & Reading R. R. Co., Trustee Penn. University, Phila., Pa.
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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING DECEMBER 10, 1895.

551,178.—AMALGAMATOR—Bowes & Philbrick, S. F.
551,112.—SHEATHING—O. R. Dahl, Seattle, Wash.
550,953.—WEIGHING SCOOP—N. S. Douglas, Oakland, Cal.
551,272.—DISHCLEANER—Finlay & Wilson, Silverton, Or.
551,160.—HOWEL AND CROZE—Foertsch & Wilhelm, S. F.
551,185.—VOTING MACHINE—F. H. Gilbert, Ridgefield, Wash.
551,122.—SOLDERING MACHINE—M. Jensen, Astoria, Or.
550,982.—TELEPHONE SIGNAL—J. A. Lighthipe, S. F.
550,985.—CUPBOARD—Lowell & Fuller, S.F.
551,088.—PNEUMATIC TIRE—E. F. Murdock, Oakland, Cal.
551,092.—THILL COUPLING—G. J. Overshiner, San Diego, Cal.
551,045.—CPOTHESLINE—J. R. Phelps, Marysville, Cal.
551,145.—ELECTRIC RAILWAY SWITCH—A. Rosenholz, S. F.
551,235.—COMPASS—L. Sirleix, S. F.
551,059.—DISHCLEANER—M. Stone, San Diego, Cal.
551,246.—CHERRYSTONER—E. Zeitfuchs, Portland, Or.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible by mail or telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

ABDOMINAL SUPPORTER.—Annie Babington, Oakland, Cal. No. 550,433. Dated Nov. 26, 1895. The object of this invention is to provide an abdominal supporter of novel construction which may either be used independently or in conjunction with an upward extension, forming a waist to surround and support the upper or bust portion of the body. It consists of a single continuous front portion fitting the abdomen, extending to the hips upon each side; independent back sections extending from the hips to near the center of the back, and provided at their meeting edges with eyelets; independent transverse elastic strips by which the adjacent edges of the back sections are permanently and yieldingly united; lacing strings hy which the adjacent edges of the front and back sections are detachably united on vertical side lines; and supplemental independently adjusting buckle straps and tahs uniting the front and back sections across the meeting side lines.

LIQUID-CONTAINING CANS.—Max L. Schleuter, Oakland, Cal. No. 550,696. Dated Dec. 3, 1895. The object of this invention is to provide an attachment for liquid-containing cans which will allow the liquid to be drawn from the can while a certain amount of vacuum is produced in the upper part hy reason of the pressure of the liquid to resist the admission of air to take its place as the liquid is heing drawn so that this vacuum, in connection with the nozzle through which the liquid is drawn, serves to check the flow of the liquid when the level in the vessel reaches the level of the air-admission pipe. It also provides for a free movement of the air in the upper part of the can when the discharge opening has heen closed so that any pressure from expansion of air within the can, caused hy heat, will he equalized and the surplus allowed to escape. It consists of a discharge passage with an extension or continuation therefrom exterior to and below the bottom of the can, a valve closing the inner end of the discharge passage with a stem extending upwardly through the top, and means for raising and depressing it to open or close the valve, a second valve fixed to the upper end of the stem to close upwardly against the seat in the top of the can when the discharge valve is opened, and to open when the discharge valve is closed, and an air pipe, one end of which opens in the can heneath the level of the discharge valve, and the other exterior to the can, said pipe containing a column of liquid which is continually overbalanced to allow air to enter when the discharge column fills the full length of its pipe, and which counterhalances the latter and prevents flow when the flowing column is less than the depth of the discharge pipe.

BICYCLE BELL ACTUATING BRAKES.—William A. Hay, San Francisco, Cal. No. 550,718. Dated Dec. 3, 1895. This invention relates to a combined brake and hell for hicycles and an actuating mechanism whereby the bell may be sounded or the hrake applied. It consists of a slidable rod, with means for moving it, a yoke at the lower end with a bell fixed therein, and a hammer or clapper suspended within the bell so as to he movahle to strike the bell when desired, a wheel having arms or cams, and a shaft journaled in the lower end of the yoke so that it is movahle when the yoke is depressed to bring it into contact with the bicycle wheel rim, the arms or cams acting when the wheel is rotated to operate the hammer and strike the hell. This wheel is so constructed that a further depression will partially lock it and cause it to roll with a frictional contact, which serves to check the speed of the bicycle wheel.

GATE.—Charley Albert Huffmaster, San Leandro, Cal. No. 550,720. Dated Dec. 3, 1895. This gate relates to that class which has wind vane attachments and adapted to assist in the opening and closing of the gate. The invention consists in combination with a gate of a wind vane attached to said gate, and means operated hy the person opening or closing the gate for operating or adjusting the vane to present either its full face or edge to the wind, according to the direction of the wind and the direction in which the gate is to he opened. The object of the invention is to provide a gate with a wind vane attachment adapted to be adjusted in such a manner that the gate may be readily opened with the assistance of the wind and closed again in the teeth of the wind with equal facility.

ADJUSTABLE IGNITER FOR EXPLOSIVE ENGINES.—Thomas G. Cantrell, San Francisco, Cal. No. 550,743. Dated Dec. 3, 1895. This invention relates to that class of igniting devices for explosive engines in which a movable electrode makes contact with a fixed electrode. The object of this invention is to provide a simple and effective means for adjusting the contact of the electrodes and varying the time of the explosion, it heing found of advantage, especially when the engine is running at high speed, to cause the explosion while the piston is still compressing, though when the engine first starts it is not advisable to do this. The invention consists of a fixed and a movahle electrode, mechanism for operating the movahle electrode and means, comprising intermeshing gears, one movable relatively to the other for adjusting said mechanism to vary the times of contact of the electrodes whereby the time of the explosions may he regulated.

ROTARY ENGINE.—John D. Keller, Santa Clara, Cal., assignor of one-half to Otto Leu of same place. No. 550,721. Dated Dec. 3, 1895. This invention relates to that class of rotary engines or rotary pumps in which radially slidahle pistons revolving concentrically with the interior of the shell are operated hy an eccentrically located cylinder which forms an ahutment at one side with the interior of the shell and a steam or water space on the other side. The invention consists in a shell having a main inlet passage, with branches leading therefrom and communicating at either side of the interior of the shell through passages, separate exhaust passages, valves in said branches controlling the exhaust passages and the passages leading to the interior of the shell, a cylinder within the shell forming an ahutment on one side therewith and a steam space at the other side, a sliding and an adjustable connection hetween the piston and cylinder, a main cut-off valve in the steam inlet intermeshing gears, one operating the cut-off valve and the other on the shaft center of the rotatahle cylinder.

COOPERS' COMBINED HOWEL AND CROZE.—Henry J. Foertsch and August H. Wilhelm, San Francisco, Cal. No. 551,160, Dated Dec. 10, 1895. This invention relates to the general class of coopers' tools, and especially to tbe tools hy which the howel and croze are made on the inside of harrels or casks. The invention consists in a combined howel and croze, the curved stock of which is provided with a socket adapted to receive the howel bit, and its holding key, said stock having also a second seat for the reception of the croze bits to lie in line with the howel bit, both the howel and croze hits projecting suitahly from the convex sole of the stock. The object of the invention is to provide a single implement adapted by one operation to form the howel and croze, therehy saving time and labor.

AMALGAMATOR.—A. Bowes and F. E. Philbrick, San Francisco. Dated Dec. 10, 1895. This invention relates to improvements in apparatus for amalgamating precious and valuahle metals. It consists essentially of a pan having the interior sides adapted to he amalgamated, dies removahly fixed in the bottom of the pan, shoes supported hy a stationary frame from ahove the pan, adapted to rest upon the dies, means wherehy the pan is caused to rotate heneath the non-revoluble shoes, horizontally extending arms secured to the frame work and from which the shoes are suspended, openings made in the side of the pan, a vertical passage into which said openings discharge extending below the hottom of the pan, an annular inclined discharge trough in line heneath the passage to receive the overflow and discharge from the pan as it rotates. A vertical shaft hy which the pan is driven has a step in the bottom which is provided with horizontal journals so that the pan may he tilted ahout these journals after the shoes and dies have been removed therefrom so as to he conveniently cleaned.

Books Received.

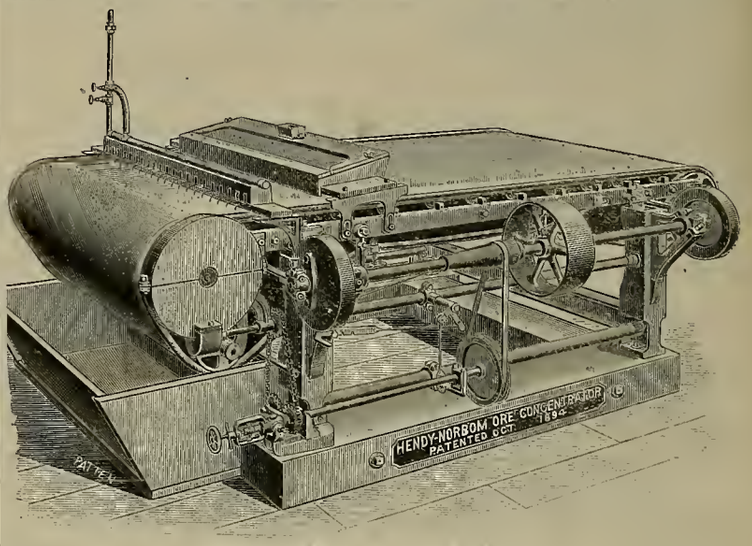
"Chemical Technology; Chemistry in Its Application to Arts and Manufactures," being Vol. II of the series. This book of 400 pages, with numerous illustrations, is deserving of most favorable mention. It treats of "The Special Application of Fuel to the Purpose of Producing Light" in a systematic way and gives much valuable information. "Fats and Oils," "Stearine Industry," "Candle Manufacture," "The Petroleum Industry and Lamps," "Miners' Safety Lamps," "Vegetable Fats and Oils," "Testing Oils and Fats," "Air Gas Machines and Carhurettors" are given exhaustive discussion, all being treated with direct practical reference to applied chemistry. The 145 pages devoted to the petroleum industry are of especial value to our readers in this State, the petroleum products of California heing second only in value to gold in the mineral production of '94. The price of the book is $4. It is published by P. Blakiston, Son & Co., 1012 Walnut St., Philadelphia.

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Office of FEDERAL LOAN MINING COMPANY, NEVADA CITY, CAL., Dec. 10, 1895.

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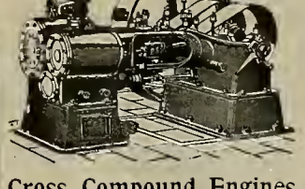
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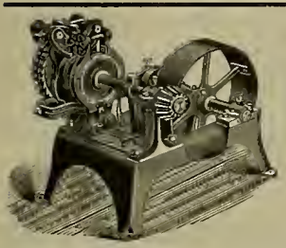
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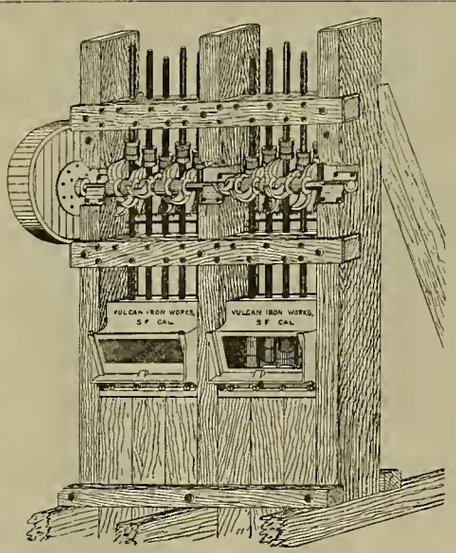
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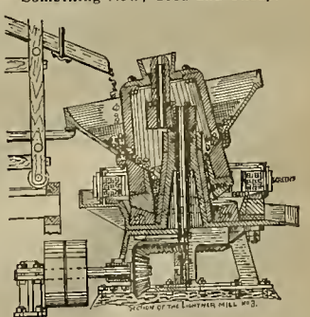
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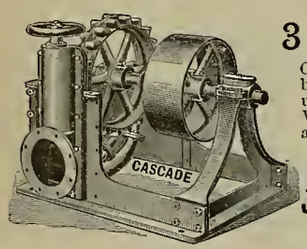
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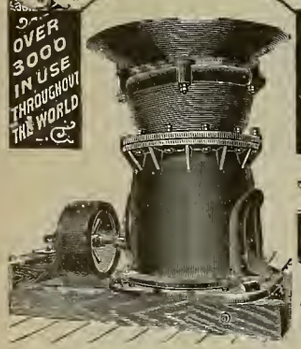
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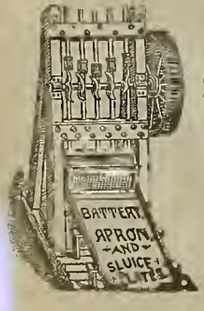
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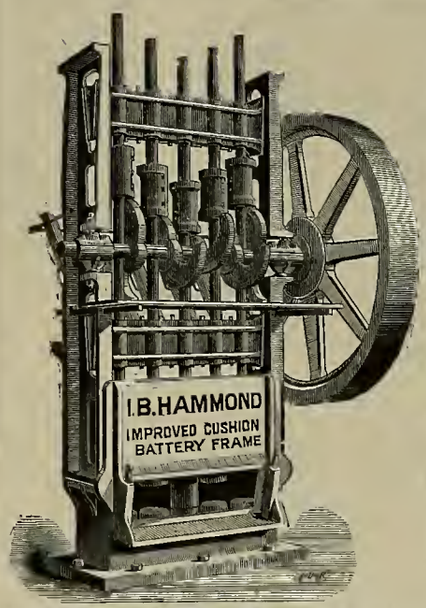
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MANUFACTURERS OF

Stamp Mills, Ore Feeders

DETACHABLE BUCKET WIRE-ROPE TRAMWAYS,

Roller Grinding Pans, Desulphurizing Furnaces, Etc.



Improved Self-Contained Cushion-Frame Five-Stamp Mill.

The Improved, Iron-Frame, Self-Contained, Cushion-Frame, Five-Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space. The term "Setf-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

FIRST: There is Saved by the Use of This Mill a Large Bill for Heavy Timbers, in Many Instances Obtained at Great Expense and Loss Of Time.

SECOND: The Saving in Mill-Wright and Mechanics' Labor in Framing and Erecting.

THIRD: The Large Amount of Space Saved.

We refer by permission to Mr. N. A. McMillan, Haines, Oregon, manager of the Blue Mountain Mining Co., at Rock Creek, Or., where ten of our stamp mills are in operation; also to Mr. John S. Miller, Helena, Montana, manager of the Diamond Hill Mining Co., operating one of our forty-stamp mills at their mines at Townsend, Montana.

Send for Catalogue and Price List.

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THE OLD RELIABLE!



ALBANY

LUBRICATING COMPOUND

TWENTY-SEVEN YEARS' CONTINUOUS SERVICE in the great Mines, Steamships, Railroads and Mills all over the world prove it to he

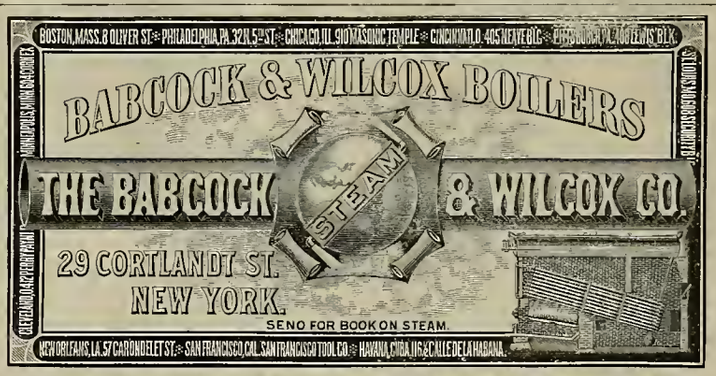
THE KING OF LUBRICANTS!

Tatum & Bowen

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DEALERS IN MACHINERY, OILS, MINING AND MILL SUPPLIES, ETC.



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Inventors on the Pacific Coast will find it greatly to their advantage to consult this old experienced, first-class agency. We have able and trustworthy associates and agents in Washington and the capital cities of the principal nations of the world. In connection with our scientific and Patent Law Library, and record of original cases in our office, we have other advantages far beyond those which can be offered home inventors by other agencies. The information accumulated through long and careful practice before the Office, and the frequent examination of patents already granted, for the purpose of determining the patentability of inventions brought before us, enables us to give advice which will have inventors the expense of applying for patents upon inventions which are not new. Circulars and advice sent free on receipt of postage. Address **DEWEY & CO., Patent Agents, 220 Market St., S. F.**

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MINING AND MILLING MACHINERY,

Automatic Cut-Off Engines, High-Speed Engines, Hoisting Engines, Quartz Mills,
Manty Chili Mills, Rolls and Concentrating Machinery, Dodd Sigmoidal Water Wheel,
PUMPS--Cornish and Other, Copper and Lead Furnaces, All Classes of Marine Work.

SHIP BUILDERS. ★ BUILDERS OF U. S. WAR SHIPS. ★ HYDRAULIC LIFT DOCK.

NEW YORK OFFICE: 145 BROADWAY. CABLE ADDRESS: "UNION."

The Edward P. Allis Company, Milwaukee, Wis.

Established 1860. Reliance Works.

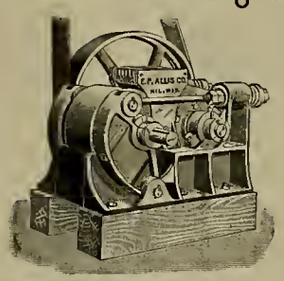
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Screens, Stamps, Pumps,
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WORK THE BEST. PRICES THE LOWEST.

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San Francisco, Cal.....9 Fremont Street.
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Denver, Col.....427 Seventeenth Street.
Minneapolis, Minn.....416 Corn Exchange.
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Kansas City, Mo.....43 Armour Building.
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WRITE FOR OUR NEW CATALOGUE.

The McGlew Ore Concentrator Company.

PATENTED SEPTEMBER 19, 1893. CHEAPEST, SIMPLEST, MOST DURABLE AND CLOSEST SAVING CONCENTRATOR IN USE. FRANK BARRERE, Secretary and Manager.

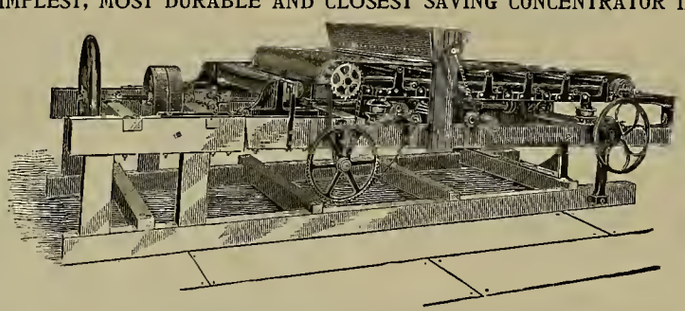
Can be seen in operation at the Company's works, 132 Main Street, San Francisco.

Office, 116 Davis Street.

NINETY-FOUR AND ONE-HALF PER CENT
—SAVED—
ON ORES DIFFICULT TO CONCENTRATE.

A MARVEL of Simplicity, Durability and Effectiveness combining both Side and End Motion with a Bumping Belt.
SPEED AND INCLINE of belt and amount of PERCUSSION easily and quickly regulated, WHILST IN OPERATION.
CAPACITY about ten tons. Only one-tenth horse power required. Adapted for either canvas or rubber belts.

PRICE.....$350 EACH
Including prepared canvas belt 4 ft. 6 ins. wide.



FALLS MINE, IGO, SHASTA CO., CAL., May 25th, 1893.
THE MCGLEW CONCENTRATOR COMPANY:—I take much pleasure in endorsing your very superior Ore Concentrator. When I was requested to examine your concentrator, I did so under protest, declaring that I would have none other than a Frue, as after many years' experience with different concentrators, I believed them to be the best.
Now, after a thorough trial of the McGlew Ore Concentrator, on ores difficult of concentration, I emphatically pronounce it the best concentrator of any I have ever used in handling my ores. It is doing CLEANER and CLOSER work than I had believed possible for any concentrator to accomplish.
Samples of pulp and tailings, taken every hour, dried, mixed and assayed, show * * * from West ledge, a saving by your concentrator of 94½ per cent; from East ledge, * * * a saving of 92 per cent. The concentrator runs very easy and requires but slight attention. One man attends to rock breaker, crusher and concentrator.
You have a good concentrator, and it can be relied upon to handle any ore that will concentrate. I most heartily recommend it to the mining public. Yours respectfully,
E. L. BALLOU, Propr. Ballou Reduction Works.



NOTICE TO GOLD MINERS!

SILVER-PLATED AMALGAMATED PLATES
For Saving Gold

IN QUARTZ, GRAVEL OR PLACER MINES. MADE OF BEST SOFT LAKE SUPERIOR COPPER.

AT REDUCED PRICES.

Our plates are guaranteed, and by actual experience are proved, the best in weight of Silver and durability. Old Mining Plates replated, bought, or gold separated. THOUSANDS OF ORDERS FILLED.

San Francisco Novelty and Plating Works

Incorporated.

SEND FOR CIRCULARS. 68, 70 and 72 First Street, San Francisco, Cal.

Justinian Caire, Agent

521 and 523 Market Street, San Francisco,

—DEALER IN—

Assayers' and Mining Material.

—MANUFACTURER OF—

BATTERY SCREENS AND WIRE CLOTH

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Hoskins' Hydro-Carbon Assay Furnaces.

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23 Park Place, - - - - New York, U. S. A.

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Monadnock Building.....Chicago
Ishpeming.....Michigan
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Sherbrook P. O.....Canada
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ADAMANTINE SHOES AND DIES

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CHROME CAST STEEL

Cams, Tappets, Bosses, Roll Shells and Crusher Plates.



These castings are extensively used in all the mining States and Territories of North and South America. Guaranteed to prove better and cheaper than any others. Orders solicited subject to the above conditions. When ordering, send sketch with exact dimensions. Send for illustrated Circular.

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Stamp Cam.

H. D. MORRIS & CO., DEALERS IN MINING MACHINERY AND SUPPLIES.

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MANHATTAN RUBBER BELTING, PACKING AND HOSE,
SANDERSON DRILL STEEL,
MORRIS CENTRIFUGAL PUMPS,
LIGHT STEEL RAIL.

Market Reports.

The Markets.

SAN FRANCISCO, Dec. 19, 1895.

The downward tendency in metals seems checked, yet buyers wait on the market. The drop in copper is believed to be but temporary. The depression in iron and steel is largely due to the usual dullness of the closing days of the year, no one caring to "load up" until after New Years. The market may he generally characterized as a waiting one. Regarding copper, Houston & Co. of New York say: "The dullness of the market here has been in marked contrast with the activity which has been of daily occurrence at the speculative center in London. Reported sales of G. M. B.'s in Novemher aggregated 21,910 tons, mostly time operations. Europe has also bought more freely of American copper since the decline, for deliveries well ahead. The recent heavy decrease in European stocks has been a marked feature in the foreign copper situation, and the finer grades have become so scarce that smelters have had to fall back upon Chili bars. Since August 1st, European visihle supply of copper has decreased 11,236 tons. With this heavy foreign demand, and a continuance of the present large consumption here, a turn in the market may occur when least expected. Imports of American copper into England and France from January 1st to about the middle of November were only 19,461 tons, against 29,597 tons during the corresponding period in 1894, and 37,693 tons in 1893. Between these dates deliveries of copper in these countries this year were 91,927 tons, or an increase of 8514 tons over 1894. Europe may now improve the opportunity to supply this deficiency hy liberal purchases of American copper at present low prices, and foreign buying may stimulate the home trade. With the transatlantic market which this country now nas for the product of its copper mines, a ready market awaits its output, although the question of price may not always be satisfactory.

The total visible supply of copper in England and France, and afloat thereto, Decemher 1st was 45,574 tons, as compared with 50,250 tons on November 1st, heing a decrease of 4676 tons during the month. Stocks of copper in public warehouses in England and France decreased during the past month 4462 tons.

Under date of the 2nd inst., Jas. Lewis & Son of Liverpool, England, say: The effect of the large decrease of 4502 tons in the public stocks of copper in England and France during the past month has heen neutralized by the large offerings of American copper of all kinds at very low prices—the equivalent of about 9.65 cents per pound having heen accepted for electrolytic. So long as this continues we cannot look for any permanent improvement in the market. Although the representatives of a number of large producing companies have sold very freely for some time past, other large producers appear to have sold hut little and will now probably have to accept still lower prices.

Good merchantable copper is to-day £2 5s per ton lower than a month ago. From £45 2s 6d on the 1st ult. cash fell to £43 10s on the 8th, advanced to £44 7s 6d on the 13th, declining again to £42 10s on the 20th, recovering to £43 10s on the 26th, and closing at £42 17s 6d per ton. About 27,000 tons have changed hands.

In sympathy with the lower prices at which American copper is offered, best selected ingots are now worth only £47, and tough cake £46 10s per ton.

Lake ingot is quoted nominally 10.87½ cents per pound.

In addition to a greatly increased consumption of copper wire for trolley cars in the United States, we learn that the Western Union Telegraph Company, during the year ending last June, added to its wire lines a length of 11,859 miles, of which over 10,000 miles were of copper, and they are replacing all defective iron wires with copper, the advantages of reduced weight, increased capacity for electrical transmission, and diminished liability to interruption from atmospheric conditions, more than compensating for the extra cost.

It is stated in the report of Hamilton Smith to the Exploration Company that annual dividends of $3,000,000 from the Anaconda Company's mines on a production of 50,000 tons fine copper per annum, or $60 per ton, can be reasonahly expected, even with a low range of prices for copper. Assuming this "low range" to he £40 per ton for good merchantable copper, the cost of production would appear to be ahout £28 per ton. There are sufficint reserves of ore estimated to he in sight for about three years' production at the rate of 50,000 tons of copper per annum.

New York Metal Market.

NEW YORK, Dec. 19.—PIG IRON—Southern, 12@12.50; Northern, 12@13.00.

COPPER — Brokers', 10.50c; exchange, 10.60c.

LEAD—Brokers', $3.15; exchange, $3.25.

TIN—Straits, 13c@13.50c.

SPELTER—Domestic, $3.40.

New York Silver Prices.

NEW YORK, Dec. 19.—Following are the closing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30¾	67	10 50	.....
Saturday	30⅝	66⅞	10 50	3 15
Monday	30¾	66	...	3 20
Tuesday	30⅜	66¼	...	.....
Wednesday	30⅜	66⅝	10 50	3 20
Thursday	30½	66⅜	.....	.....

The local bullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum.....7@8
Commercial Loans, prime.....6@8
Call Loans, gilt edged.....7@8
Call Loans, mixed securities.....7@8
Mortgages, prime, taxes paid by lender.....6@8
New York Sight Draft.....5c
New York Telegraphic Transfer.....7½c
London Bankers' 60 days.....$4.88¼
London Merchants.....$4.86½
London Sight Bankers.....$4.89½
Refined Silver, per oz., 1000 fine.....66⅝c
Mexican Dollars.....54c

San Francisco Metal Market.

COPPER.

Bolt.....¼ & 5-16, 21c; ⅜ and larger, 22c
Lake Superior Sheathing..... 23 @ —
Ingot, johhing..... — @ 19
Ingot, wholesale..... 18 @ —
Sheet copper..... — @ 22

ZINC.

Sheet..... 9½@

LEAD.

Pig..... — @ 3 85
Bar..... — @ 4 15
Sheet..... — @ 5 50
Pipe..... — @ 4 75

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs...$1 40
Drop, B and *larger* sizes, " " ... 1 65
Buck, Balls and Chilled, do, " " ... 1 65

IRON.

American Soft.....22 00 @26 00
Pig, per ton.....18 00 @20 00

STEEL.

English, lh..... 16 @ 19

COKE.

Gas Companies'..... 75c ₱ bbl.
English, to load..... 9 00 @ 10 00
" spot, in hulk..... — — @ 13 00
" in sacks..... — @ 15 00
Cumberland..... 9 00 @ — —

ANTIMONY.

Per lh..... — @ 10

PIG TIN.

Per lh..... 15 @ 16 00

QUICKSILVER.

Home trade, per flask.....39 00 @ 40 —

BORAX.

Refined, in car lots..... — @ 5⅛
Refined, in sacks and harrels..... — @ 5⅜
Powdered, in car lots..... — @ 5⅝
Concentrated, " ..... — @ 4⅞

TIN PLATE.

Per hx..... 4 75 @ 5 00

ZINC.

Sheet..... 8½@

NAILS.

Wire..... $1 75
Cut..... 1 50

LUMBER.

SAN FRANCISCO—WHOLESALE.

Redwood, Fluming.....17 00 @ — —
Pine.....13 00 @ 18 00
Spruce.....25 00 @ 30 00

COAL.

SPOT FROM YARD—PER TON.

Wellington.....$ 8 00
Greta..... 7 50
Nanaimo..... 7 00
Gilman..... 6 50
Seattle..... 6 00
Coos Bay..... 5 00
Cannel..... 8 50
Egg, hard..... 10 00
Wallsend..... 7 50
Scotch Splint..... 6 50
Brymbo..... 7 50

TO ARRIVE—CARGO LOTS.

Australian..... 5 35
Liverpool Steam..... 5 87
Scotch Splint..... 6 50
Cardiff..... 6 00
Lehigh Lump..... 9 00
Cumberland..... 8 50
Egg, hard..... 10 00
West Hartley..... 6 50

From South Africa.

Lydenhurg correspondence South African *Mining Journal and Financial News*: Messrs. G. H. Starr, general manager of the Consolidated Goldfields, and Charles Butters, of the Rand Central Ore Reduction Co., passed through Lydenhurg on November 7th, on their return journey to the Rand, after a tour of inspection through De Kaap and Lydenhurg gold fields. The special object of Mr. Starr's visit was to inspect certaiu valuable mining properties owned hy the Goldfields of Lydenburg Co. at Belvedere, consisting of 5300 claims, which are distributed over a block of fifteen farms, on which active exploration and development are being diligently carried on, and mining operations are progressing satisfactorily.

The formation at Belvedere differs from that at Pilgrim's Rest in that the Belvedere reefs are found in the lower sandstone, whilst those farther south are in the dolomite and upper sandstone.

The Consolidated Goldfields are still acquiring farms and claims in the Lydenburg district from owners who are reasonahle in their demands and are not asking too fancy a price for their property.

The main object of Mr. Butters in visiting Pilgrim's Rest was that of thoroughly inspecting and overhauling the cyanide works at the Clewer, Theta and other well-known mines, and sampling their ores and residues with a view, it is understood, to the construction there, at an early date, of reduction works of the most approved type on a large scale.

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied.	Delinq't and Sale.	Secretary.
Best & Belcher M Co, Nev	59	25c	Nov 4,	Dec 9,	Dec 30. M Jaffe, 309 Montgomery
Bullion M Co, Nev	46	10c	Nov 4,	Dec 9,	Dec 30. R R Grayson, 331 Pine
Bulwer Con M Co, Cal	11	5c	Oct 29,	Dec 4,	Dec 31. C E Elliot, 309 Montgomery
Con Cal & Va M Co, Nev	5	25c	Nov 22,	Dec 28,	Jan 16. A W Havens, 309 Montgomery
Confidence M Co, Nev	26	30c	Nov 13,	Dec 18,	Jan 8. A S Groth, 414 California
Chollar M Co, Nev	41	25c	Nov 12,	Dec 17,	Jan 7. C E Elliot, 309 Montgomery
Gold Bar Con M Co, Cal	2	3c	Nov 5,	Dec 21,	Jan 16. E C Codfrey, Crocker Building
Gould & Curry S M Co, Nev	77	15c	Nov 5,	Dec 10,	Dec 30. A K Durhrow, 309 Montgomery
Hale & Norcross S M Co, Nev	108	15c	Dec 10,	Jan 15,	Feb 7. A B Thompson, 309 Montgomery
Hite G M Co, Cal	2	10c	Dec 17,	Jan 20,	Feb 10. H E Mathews, 120 Sutter
Jamison M Co, Cal	7	2c	Nov 9,	Dec 16,	Jan 6. S W Cheyney, 120 Sutter
Marguerite M Co, Cal	1	10c	Nov 2,	Dec 2,	Jan 5. Chas. Winters, 237 12th St., S F
Mexican M Co, Nev	53	25c	Nov 19,	Dec 23,	Jan 14. C E Elliot, 309 Montgomery
Occidental Con M Co, Nev	21	15c	Dec 17,	Jan 20,	Feh 10. Alfred K Durbrow, 309 Montgomery
Ophir S M Co, Nev	67	25c	Nov 5,	Dec 9,	Dec 30. E B Holmes, 309 Montgomery
Overman S M Co, Nevada	74	10c	Dec 2,	Jan 6,	Jan 27. G D Edwards, 414 California
Superior M & M Co. Cal	1	5c	Nov 5,	Dec 9,	Dec 30. J Howard Barnard, 916 Market, S F
Yellow Jacket M Co, Nev	60	25c	Nov 12,	Dec 17,	Jan 22 W H Blauvelt

Mining Share Market.

SAN FRANCISCO, Dec. 19, 1895.

The market was quiet and featureless the past week, creating some disappointment to those who looked for the supposed outside parties to take up another stock for an upmove. It would seem from the way in which the little spurts have been made that the manipulators are preparing for another spurt and then let go and let prices fall back again. It is safe to assert that the stock to he taken up will be the one that the outside public holds little of, so the move can be better managed. When moneyed men are in the market it makes but little difference whether the outside holds or not, for they are prepared to take everything thrown at them, even at high prices. But men having little money cannot, even hy combining, go beyond a certain limit. Then, again, outside pools or combinations have not the cohesiveness of a moneyed pool. This is due to the fact that one or more of the members work against the others hy buying shares unknown to them and then selling out just before or at the time the pool does. Of necessity this breaks a deal unless the other members of the pool can handle all the shares offered, when a corner can be run and hetter prices obtain by having secured large holdings and a short interest. Although the market looks bad and seems to be badly managed, yet there is an undertone which will bring about better prices before the first half of 1896 passes. This opinion is founded on the fact that when prices have been forced down around the midwinter holidays much higher prices followed in the months of April, May and June. As the market has heen kept down for months and large lines of shares secured from long holders, the usual spring deals under such circumstances can be looked for, and they may he run hy parties having more money than those who are reported to be manipulating the market now.

The news from the Comstock mines continues of the most favorable character, although the public do not recognize it, owing to the market not acting in sympathy. The work, as a rule, is be ng pushed in the direction for making important strikes. Some of the work was stopped just at the time when, by driving ahead for two or three days, an ore strike would have been made. That inside parties are not yet ready for these strikes is thoroughly apparent, as experience has taught that it is much better to find out how large the ore development will prove. Much of this kind of work is being done, which will unquestionably lead to the uncovering of large hodies of ore hefore another twelve-month rolls around.

In the Alta group the work is still in the right direction in Alta, hut it looks as if the management is trying to kill time, use up money and hring ahout an assessment before a strike will he made. The same remarks apply to some of the Gold Hill mines. In this group the work is towards the west in Seg. Belcher, Belcher and Crown Point. This work, if not stopped too soon, will strike the west lode. This lode is mostly gold-bearing, and averages from $40 to $80 a ton its full width, although streaks in it run over $1000 to the ton. It will take time after a strike has been made to develop the lode. In Overman, Kentuck and Yellow Jacket the work is kept from the public, or, at least, not published, which causes many to think there is something more important being done in them than the public is led to helieve. In Challenge and Confidence very little is reported to encourage the public, notwithstanding the work being done is uncovering an important hody of ore. It will probably require the striking of the ore on a lower level before anything much can be done with it to advantage.

In the Con. Imperial the work is being lazily pushed, evidently to get in another assessment before striking the ore found in Challenge and California. In Alpha a large flow of water is reported, which is accepted as a favorahle sign. In Bullion, Gould & Curry, and Best & Belcher the weekly reports continue unchanged. Something now ought to come to the front hefore many weeks pass by. In Potosi, Chollar, Hale & Norcross and Savage care seems to be taken not to have the work run into anything which will excite the cupidity of the public. In each of these mines veins and small leads of varying width are heing followed; by doing so time is consumed and the money used up. When they push west then strikes can he looked for. In Con. Virginia is where the most active work is reported and on several levels. It is the belief that when the powers that he see fit to have a hody or ore run into it can he done within a short time. At any rate the work now being done is putting the mine into excellent shape so as to take out more advantageously the ore found from the 1600-foot level down. On the 1000-foot level the work deserves close watching. In Ophir, Mexican, Union and Sierra Nevada the work is being closely watched by well-informed miners. They express the belief that before the end of 1896 very important results will follow the work now under way. In Ophir, Mexican and Union the work is on different levels, and towards the west. Andes, so far as the work is concerned, is not mentioned. On the Brunswick lode several shafts are heing sunk for the purpose of expediting work at a lower depth. Savage work on this lode is hoth of an exploiting and development character. Miners expect good results before six months pass. In the Occidental mine there is nothing of special interest to report. The belief prevails that something important will he run into before long—say inside of three or four months. From the Bodie district the news is uninteresting, and nothing of an important character is expected until work in Bodie is started and pushed on a much lower level thau they are now at work on. Where they are now working helps very materially in using up funds so as to levy another assessment. In the other mines in this district the work is essentially unchanged from that heretofore reported in this paper.

The following illustrates the changes of the week:

Mines.	Dec. 12.	Dec. 19.
Alpha	$ 19	$ 19
Alta Consolidated	12	.....
Andes	19	.....
Belcher	28	28
Best & Belcher	80	.....
Bodie	40	38
Bullion	16	.....
Challenge	25	26
Chollar	22	.....
Confidence	72	.....
Consolidated California and Virginia	2 15	2 00
Consolidated New York	.....	.....
Crown Point	27	23
Exchequer	.....	06
Gould & Curry	42	39
Hale & Norcross	86	84
Justice	.....	.....
Mexican	37	32
Ophir	1 30	1 30
Overman	09	09
Potosi	54	50
Savage	36	30
Sierra Nevada	60	45
Union	49	40
Utah	05	.....
Yellow Jacket	18	39

San Francisco Stock Board Sales.

SAN FRANCISCO, Dec. 19, 1895.

9:30 A. M. SESSION.

100 Alpha..... 19
100 Bodie..... 38
250 Hale & Norcross..... 84
200 Mexican..... 30
500 Occidental..... 50
50..... 51
100 Ophir..... 1 30
350 Potosi..... 50
200 Savage..... 30
150 Sierra Nevada..... 45
300 Yellow Jacket..... 39

SECOND SESSION—2:30 P. M.

100 Ophir..... 1 30
350 Alpha..... 18
100 Mexican..... 32
200 Belcher..... 28
50..... 31
250 Sierra Nevada..... 45
200 Gould & Curry..... 39
700 Exchequer..... 06
200 C. C. & Va..... 2 00
400 Overman..... 08
100 Savage..... 30
100..... 09
200 H. & N..... 84
200 Union..... 40
100 Crown Point..... 23
200 Challenge..... 26
150 Yellow Jacket..... 39
670 Occidental..... 51

Assessment Notices.

CON. CALIFORNIA & VIRGINIA MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the 22d day of November, 1895, an assessment (No. 5) of twenty-five (25) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 48, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of December, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on THURSDAY, the sixteenth (16th) day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. W. HAVENS, Secretary.

Office—Room 48, Nevada Block, No. 309 Montgomery street, San Francisco, California.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 17th day of December, 1895, an assessment (No. 21), of fifteen (15) cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of January, 1896, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 10th day of February, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED R. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

HITE GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Mariposa County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the seventeenth day of December, 1895, an assessment (No. 2) of 10c (ten cents) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 120 Sutter street, Room 27, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of January, 1896, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 10th day of February, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

H. E. MATHEWS, Secretary.

Office—Room 27, 120 Sutter street, San Francisco, California.

DELINQUENT SALE NOTICE.

SUPERIOR MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placerville, El Dorado County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 5th day of November, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
James Black	166	25	$ 1 25
E. J. Bowen	214	200	10 00
F. M. Dickerhoff, Trustee	75	5,000	250 00
F. M. Dickerhoff, Trustee	76	5 000	250 00
F. M. Dickerhoff, Trustee	77	5,000	250 00
F. M. Dickerhoff, Trustee	78	2,000	100 00
F. M. Dickerhoff, Trustee	80	1.000	50 00
F. M. Dickerhoff, Trustee	81	1,000	50 00
F. M. Dickerhoff, Trustee	82	1.000	50 00
F. M. Dickerhoff, Trustee	88	100	5 00
F. M. Dickerhoff, Trustee	89	100	5 00
F. M. Dickerhoff, Trustee	90	100	5 00
F. M. Dickerhoff, Trustee	91	100	5 00
F. M. Dickerhoff, Trustee	93	50	2 50
F. M. Dickerhoff, Trustee	94	50	2 50
E. R. Dickerhoff	6	50	2 50
A. J. Dickerhoff	7	50	2 50
Thos. Douglass	95	25	1 25
F. W. Evans	8	50	2 50
M. A. Evans	9	50	2 50
Frank Evans	16	25	1 25
Mamie Evans	17	25	1 25
Cora Evans	18	25	1 25
Frank Goyan, Trustee	37	2,000	100 00
Frank Goyan, Trustee	38	2,000	100 00
Frank Goyan, Trustee	39	2,000	100 00
Frank Goyan, Trustee	40	2,000	100 00
Frank Goyan, Trustee	41	2,000	100 00
Frank Goyan, Trustee	42	2,000	100 00
Frank Goyan, Trustee	43	2,000	100 00
Frank Goyan, Trustee	44	1,000	50 00
Frank Goyan, Trustee	45	1,000	50 00
Frank Goyan, Trustee	46	1,000	50 00
Frank Goyan, Trustee	47	1,000	50 00
Frank Goyan, Trustee	48	1,000	50 00
Frank Goyan, Trustee	49	1,000	50 00
Frank Goyan, Trustee	218	750	37 50
Frank Goyan, Trustee	233	1,720	86 00
John Lord	206	75	3 75
D. L. Munson, Trustee	52	140	7 00
D. L. Munson, Trustee	53	800	40 00
D. L. Munson, Trustee	54	100	5 00
D. L. Munson, Trustee	55	177	8 85
D. L. Munson, Trustee	99	250	12 50
D. L. Munson, Trustee	101	200	10 00
D. L. Munson, Trustee	102	200	10 00
D. L. Munson, Trustee	107	100	5 00
D. L. Munson, Trustee	113	50	2 50
D. L. Munson, Trustee	114	50	2 50
D. L. Munson, Trustee	116	25	1 25
D. L. Munson, Trustee	121	500	25 00
D. L. Munson, Trustee	125	100	5 00
D. L. Munson, Trustee	128	12	60
D. L. Munson, Trustee	129	5	25
D. L. Munson, Trustee	130	5	25
D. L. Munson, Trustee	133	20	1 00
D. L. Munson, Trustee	134	20	1 00
D. L. Munson, Trustee	135	20	1 00
D. L. Munson, Trustee	137	5	25
D. L. Munson, Trustee	140	100	5 00
D. L. Munson, Trustee	144	20	1 00
D. L. Munson, Trustee	150	50	2 50
D. L. Munson, Trustee	155	20	1 00
D. L. Munson, Trustee	156	20	1 00
D. L. Munson, Trustee	162	100	5 00
D. L. Munson, Trustee	163	25	1 25
D. L. Munson, Trustee	185	10	50
D. L. Munson, Trustee	187	5	25
D. L. Munson, Trustee	188	264	13 20
D. L. Munson, Trustee	213	9,255	463 25
D. L. Munson, Trustee	219	1,000	50 00
D. L. Munson, Trustee	222	55	2 75
D. L. Munson, Trustee	229	3,232	116 15
D. L. Munson, Trustee	1(new)	500	25 00
D. L. Munson, Trustee	2(new)	500	25 00
D. L. Munson, Trustee	3(new)	600	30 00
D. L. Munson, Trustee	7(new)	20	1 00
D. L. Munson, Trustee	11(new)	300	15 00
D. L. Munson, Trustee	15(new)	22,224	1,111 20
D. L. Munson, Trustee	18 new)	100	5 00
D. L. Munson, Trustee	27(new)	320	16 00
D. L. Munson, Trustee	28(new)	46	2 30
W. F. Nelson & Son	24(new)	20	1 00
W. F. Nelson & Son	29(new)	20	1 00
Mrs. S. M. Overton	14	622	31 10
Leander Silvester	120	20	1 00
Leander Silvester	172	10	50
Leander Silvester	173	10	50
Leander Silvester	16(new)	10	50
Crescenta Whitney	19	25	1 25
J. N. Witherow	171	25	1 25
S. L. Waide	4	50	2 50
Cora Waide	5	50	2 50
Milton Waide	11	25	1 25
Ella Waide	12	25	1 25
Artie Waide	13	25	1 25
Howard Waide	14	25	1 25
A. Waide	15	25	1 25

And in accordance with law, and an order from the Board of Directors, made on the 5th day of November, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, No. 916 Market St., room 81, San Francisco, California, on MONDAY, the 30th day of December, 1895, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. HOWARD BARNARD, Secretary.

Office, 916 Market St., room 81, San Francisco, California.

DELINQUENT SALE NOTICE.

JAMISON MINING COMPANY.—LOCATION OF principal place of business, San Francisco, California. Location of works, on Jamison creek, near Johnsville, Plumas County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 7) levied on the 9th day of November, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
George Hackett	195	250	5 00
J. C. Kinckrem	147	70	1 40
B A. Knight	142	500	10 00
Edwin O. Knight	144	500	10 00
James Morgan	190	150	3 00
John Sparks	164	1000	20 00
John Sparks	165	1000	20 00
John Sparks	166	2000	40 00
John Sparks	167	1000	20 00
John Sparks	168	1000	20 00
John Sparks	169	500	10 00
John Sparks	216	500	10 00
C. L. Taylor	123	500	10 00
Wm. Trathen	139	500	10 00
Chas. Troon	124	500	10 00

And in accordance with law, and an order from the Board of Directors, made on the 16th day of December, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, rooms 50 and 54, 120 Suttter St., San Francisco, California, on MONDAY, the 6th day of January, 1896, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

SAM. W. CHEYNEY, Secretary.

Office, Rooms 50 and 54, 120 Sutter St., San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 27) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	294	5,000	$500 00
M. J. McDonald	453	250	25 00
M. J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	357	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Litce, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	38	3 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. E. Isbine	462	100	10 00
H. H. Noble, Trustee	423	4,000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on November 2, 1895, the above sale is postponed to MONDAY, the 2d day of December, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on December 2, 1895, the above assessment is postponed to TUESDAY, the 31st day of December, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from Wm. A. Roberts and John Graham, in the Fore t Home mine, Amador county, to impound tailings behind a dam in Arkansas creek; from James F. Ish, in the Bull Neck mine, near Volcano, Amador county, to impound tailings in dry ravines; from Henry Dickerman et al., in the Mill Gulch mine, near Amador, Amador county, to impound tailings behind a dam below the mine; from John G. Ramm, in the Jay Bird mine, near Campionville, Yuba county, to impound tailings below the mine; from Schillanskey & Co., in the Wild Yankee mine, Shady Run, Placer county, to impound tailings behind a dam in a ravine; from W. H. Cole, in his mine in Mountain Tp., El Dorado county, to impound tailings behind dams in a dry ravine; from A. B. Jacks and John Clifford, in the Badger Hill mine, near Spanish Ranch, Plumas county, to impound tailings behind a dam in Woods Ravine; from John Schafer, in the Pin Leaf mine, near Spanish Ranch, Plumas county, to impound tailings in an old pit; from Geo. C. Sargent, in the Quaker Hill mine, Nevada county, to impound tailings on a flat south of Cherry Creek; from James Meeha , in his mine near Agneduct City, mador county, to impound tailings below the mine; from J. N. Findley, in the Trafton mine, near Yankee Jims, Placer county, to impound tailings in a ravine below the mine; and from George W. Smith, in the Irish Hill mine, near Oleta, Amador county, Cal., to impound tailings behind a dam in a ravine—gives notice that a meeting will be held at Room No. 92, Flood Building, San Francisco, Cal., on Dec. 23rd, 1895, at 1:30 P. M.

SPECIAL MEETING.—A SPECIAL MEETING of the stockholders of the Sonora Extended Mining Corporation will be held at the office of the company, 213 Jackson street, San Francisco, California, on MONDAY, the 30th day of December, 1895 to consider and order on an offer to purchase the plant, the mine and other property of the corporation, and to authorize and empower the directors to sell the same, and to execute or cause to be executed a proper deed of conveyance of said property to the purchaser.

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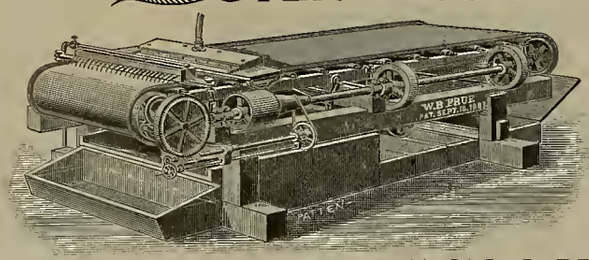
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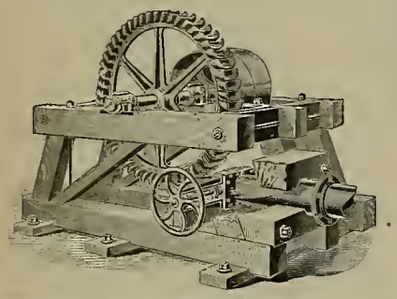
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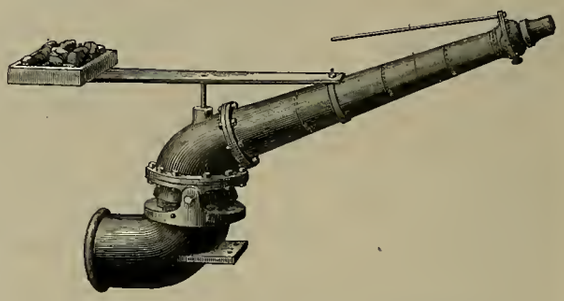


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AND PACIFIC ELECTRICAL REVIEW.

VOLUME LXXI. Number 26. SAN FRANCISCO, SATURDAY, DECEMBER 28, 1895. THREE DOLLARS PER ANNUM. Single Copies, Ten Cents.

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Gasoline Launch, Lucero.

Many accounts have been given of the gasoline yacht Lucero, built for Mr. Chas. L. Fair of this city, and owing to the variance of these accounts, this journal has concluded to give its readers an authentic description of tbe largest gasoline yacht in the world.

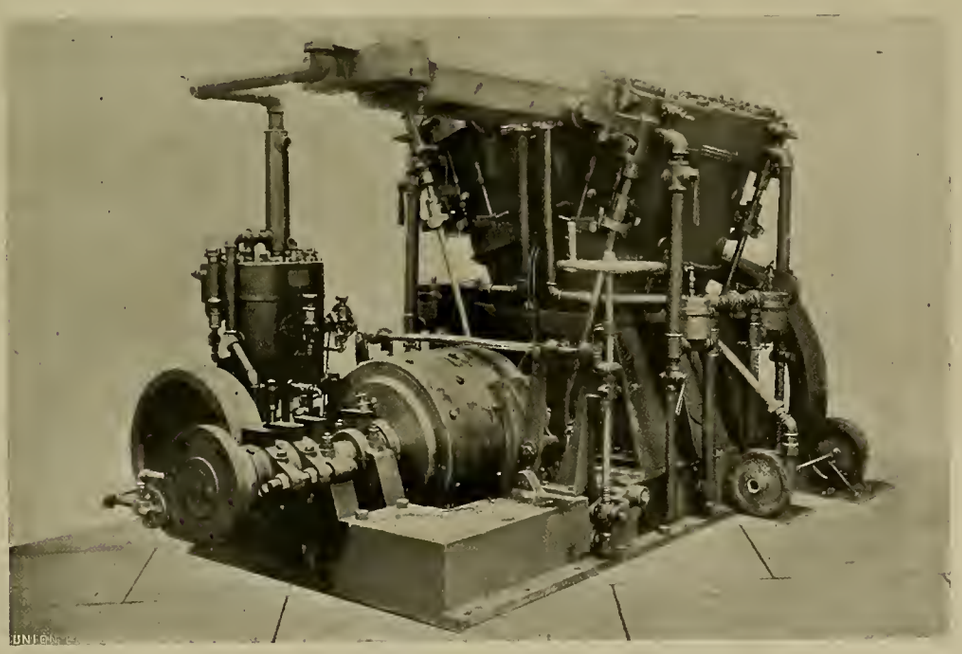
We illustrate herewith the engine and also the hull of this much advertised craft. The engine is of the four-cylinder, incliued type, and under the brake exerts 121 H. P. It has a direct connection from crank shaft to propeller shaft, that is, there is no intervening gearing, but it is coupled directly. Tbe reversing is accomplished through a differential gearing situated on the shaft, and tbe "go ahead," "stop" and "backward" motion is accomplished by one hand-wheel. Tbe hull is 100 feet over all, with an extreme beam of 16 feet 8 inches. The draft forward is 5 feet 8 inches, and aft 6 feet 8 inches. The length on water line is 82 feet. The frames are built of yellow bark oak, steam bent to shape; planking of vertical grain fir, in long lengths; deck of same material as planking; below water line fastenings are of Tobin bronze, balance galvanized iron; hull also shieved with copper below water line; stemband, rudder and shoe are of Tobin bronze; hull has pilot house and captain's room on deck, also three sky-lights, all of which are made of Brazilite, finished natural, and rubbed to a high polish.

All cabins and staterooms below deck, of which there are four, are finished in the same wood and style. All hardware is of polished brass, both on and below decks.

Tbe hull has also a bath and toilet room on board, and one diningroom with movable center tables and revolving chairs, and a seating capacity of eight people. Staterooms bave all the modern conveniences, such as closed lockers and drawers, wash stand and electric lights. Main parlor and saloon has settees on both sides, which can be changed into berths. All lockers have mirrors which set off the pannelling to great advantage. Galley and pantry are situated on the left. All cooking is done by electricity. The crew's quarters are forward of the engine-room and communicated with the deck by hatchway. Forward of the crew's quarters are situated the gasoline tanks, with a capacity of 2900 gallons. These tanks are made double, and every precaution has been taken to make them absolutely safe. The engine room is one solid tank of galvanized iron and asbestos sheeting. The hull was built in Seattle, Wash., by the Seattle Boat and Launch Building Co. The small engine shown on the rear of the frame is of 6 H. P., and is used for driviug the electric lighting and cooking appliances. It is also arranged so that the main engine can be started from it. The large engine occupies a space of six feet in width by ten feet in length and weigbs nine tons. On a run of sixty-eight hours the engine never beated or required any attention except oiling. The engine was built by the Union Gas Engine Co. of San Francisco, who are the oldest manufacturers of this power in America.



THE LAUNCH LUCERO ON THE WAYS.



ENGINE OF THE GASOLINE LAUNCH LUCERO.

Close of Volume LXXI.

This is tbe last issue of the seventy-first volume of this paper. It began its existence in May, 1860, and in the next six months will complete its 36th year. While age of itself is no claim to consideration, yet the Mining and Scientific Press believes it can say without any derogation of its own dignity that so many years of honorable and successful existence give any journal a prestige denied ephemeral publications. It is to be also borne in mind that that very fact constitutes a requirement that no paper can rest on laurels won, but must keep up with the times if not a little in advance. It is for our thousands of readers all over the country to say wbether such requirement is met. It can be truthfully said that at no period of its existence has it had a more prosperous outlook. It is our intention to make it merit the highest meed of prosperity, and it will be our endeavor to have it said of this paper that it is not only the oldest mining paper on the continent but the best. The table of contents for the last six months published elsewhere show the scope and character of its pages. Anything aud everything that directly or indirectly applies to mining, popular science, mechanical and general industry receives prompt and accurate notice. For the thirty-fifth time we wish our readers "A Happy New Year."

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J. F. HALLORAN.....General Manager

San Francisco, December 28, 1895.

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Concentrates.

THE gravel miners are waiting for rain.

THE Mayflower gravel mine paid dividend No. 21, $6000, on the 20th.

THE Salt Lake, Utah, mining exchange was opened on the 26th inst.

IT is thought that there are over 14,000 working miners in this State.

UTAH will become the 45th State of the American Union next Saturday.

THE California Gold Mining Exchange has been established with twenty-two charter members.

SEC'Y SMITH decides that State surveyors-general may appoint non-resident deputy mineral surveyors.

MERCUR, UTAH, claim owners declare they will "bore a hole through the first man found molesting stakes."

IT is locally asserted that Capt. DeLamar will build another big mill at the Mercur, Utah, mine next spring.

THE Bald Eagle, Alaska, mine has netted its owners $75,000 this season. N. S. Trowbridge is superintendent.

APPLICATIONS for patent for mineral claims are at present more numerous in the columns of interior State papers than for several years past.

THE change in mining methods is illustrated by a statement in this paper in March, 1877, of smelter charges in Inyo Co., this State, aggregating $39 per ton.

AT the sale of the Young America mine, Sierra Co., the property was bid in by W. P. Veuve for $11,339.48. It will be reopened and actively worked next spring.

BROAD-GUAGE trains are now running directly into the town of Cripple Creek from Denver over the Santa Fe, Colorado Midland and the Midland Terminal railroads.

SOUTH AFRICAN PAPERS say that in five years' time 8000 stamps will be in operation in the Witwatersrand district. In '92 there were 1970 stamps running; at the beginning of this year 2642; there are now about 3500.

STATISTICS for '95 are not yet procurable, but State Mineralogist Crawford thinks that the gold yield of California for this year will exceed $15,000,000; for '94 the aggregate was $13,923,281.89; for '93, $12,422,811.60.

THE Julian Gold Mining Co., recently incorporated, will develop three ledges on the 120 acres recently acquired from L. Schilling, five miles from Julian, San Diego Co., Cal. The secretary writes that a stamp mill will shortly be erected.

PECK BROS. have completed their plant at the Mexican mill to extract the gold and silver in the tailings. They proposed to build a wire-rope tramway from the Morgan mill tailings back to the Mexican mill, where their plant is situated, and to reduce the Morgan mill tailings at the Mexican mill.

SUPT. T. J. DICKIE has finished the new mill at the Union-Companion mine, Cornucopia, Or. It has twenty 1000-lb stamps and will he operated hy electricity. A gravity system tramway will carry the ore from the mine to the mill, a quarter of a mile. It is expected to he the largest bullion producer in that country.

THE Lawrence Reduction Works at Lawrence, Cripple Creek, Col., were totally destroyed hy fire last Monday. About 2500 gallons of gold solution valued at $7000 were lost. There was $40,000 worth of orc in the hins awaiting treatment. The plant cost $100,000. The loss of supplies is $8000; insurance, $50,000.

WITH the opening of '96, the personnel of the U. S. Debris Commission in this city will he changed considerably. Col. Mendell, recently retired, is succeeded hy Col. Chas. R. Sutte. Lieut.-Col. H. H. Benyaurd goes to St. Augustine, Fla. Major W. H. Heuer is transferred to Cincinnati, O., and will he succeeded hy Maj. C. F. L. B. Davis, now on duty at Washington, B. C.

FROM Montana's higgest mining town comes the higgest and hest edition of any newspaper ever published in the region round about—the Butte *Miner*, grandly illustrated, 36 pages of solid facts concerning the mining industry of that thriving locality.

CONGRESSMAN SHAFROTH, of Colorado, has introduced a bill providing that all mining claims hereafter located shall be staked with stakes 100 feet apart, so as to clearly define the boundaries of all claims, and prevent, as far as possihle, the overlapping of claims. Shafroth says that the staking will be slightly more expensive, hut will save a great deal of trouble and law-suits in the future.

THE Committee on Mines and Mining in the House of Representatives in the 54th Congress is composed of D. D. Aitkin of Michigan, chairman; Hartman of Montana, Leisenring of Pennsylvania, Mondell of Wyoming, Crump of Michigan, Graff of Illinois, Eddy of Minnesota, Hardy of Indiana, Cannon of Utah, Tate of Georgia, Cockrell of Texas, Neill of Arkansas, Kendall of Kentucky.

NEW SOUTH WALES MINERS want a convention at Sydney "to consider the mining laws, to suggest any amendments therein, to make suggestions concerning the wants of the several mining centers, to suggest methods by which the mineral resources of the colony may he more effectually developed, to consider the advisableness of erecting batteries on some of the gold fields, and generally to suggest and consider questions which will tend to advance the mining interest."

D. COLLINS, an employe of the Independence mine at Victor, Colorado, met a terrible death last week. He had stepped on the cage and gave the signal to hoist him to the surface. After it had started, it is thought that he remembered he gave the wrong signal, as he wished to stop at one of the upper levels. Reaching over to catch the bell cord, he lost his balance and fell, his body catching between the cage and the timbering of the shaft. After the cage had passed upward, his body, which was crushed to a pulp, fell to the lower level.

CLAIM-JUMPING is reported from various localities. That procedure is not so easy nor so profitahle as it used to be. The burden of proof is upon the contestor. The land office is inclined to favor the claim-owner, provided he has shown, or is willing to show, a disposition to comply with the requirements of the assessment law. There is no recognized rule of measurement by which it can be definitely determined as to whether the owner has performed work which might have cost him $100, and those who expect to get rich by jumping claims are apt to meet with deserved disappointment.

BEING asked this question: "Suppose a prospector were to find a ledge of free-milling gold quartz, two surfaces of which were exposed for a distance of 150 feet each in width, for a distance of 1200 feet in length, like one edge of a box; suppose the whole surface would give an average assay of $10 per ton and the ledge had convenient water and wood facilities: how much ought it to sell for, undeveloped?" the Salt Lake *Tribune* conservatively replies that, probably it would pay the discoverer far better to do some development work on it than to offer it for sale; he may be sacrificing too good a thing.

IN Denver, recently, Governor Richards of Wyoming told how near he escaped heing a millionaire. "I visited San Francisco," said he, "at a time when there was quite a rage in stocks on the Comstock lode, and felt a touch of the fever. I saw that Ophir stock was down to rock hottom, and called upon a friend of mine who was a broker to ask his advice as to making an investment of $1000 in Ophir. I think the stock was quoted at 40 cents a share. The broker laughed at my faith in the stock, and insisted that I should return to Colorado without leaving any money in California. Six months after Ophir was selling at $750 a share."

THE annual report of the Globe Smelting and Refining Company of Denver shows a production of bullion in 1895 amounting to $4,541,713.91. Of this Utah contributed 328 ounces of gold, 305,269 ounces of silver and 2,626,715 pounds of lead; Montana, 275 ouuces of gold, 19,379 ounces of silver and 232,849 pounds of lead; Idaho, 2491 ounces of gold bullion, 439,872 ounces of silver, and 11,371,369 pounds of lead. The value of the Globe company's output was divided up among the metals as ollows: Gold, 58,115.1 ounces, at $20.67, $1,201,239.12; silver, 3,483,682.3 ounces, at 65.4c., $2,513,768.22; lead, 25,371,575 pounds, at 3.12c., $791,593.14; copper, 319,213 pounds, at 11c., $35,113.43. Total, $4,541,713.91.

A LIST has heen puhlished of companies formed to operate mines in British Columhia. The aggregate amount of their capitals is away up in the millions. This list is being copied in papers all over the country. This is unfortunate, because it is exceedingly misleading. Some of the companies it names scarcely had any existence at all except on their prospectuses, others have died since, while of those that remain only a small portion of the capital is paid up. It is a pity to publish such statements about a country; they only give it a "black eye." The Nelson, B. C., *Miner* notes with pleasure the suggestion of the Spokane *Chronicle* that the capital stock should represent the value of the investment.

AT last Monday's meeting the Dehris Commission issued permits to the owners of the Lost Camp mine, near Blue Canyon, Placer county; Forest Home mine, Amador county; W. H. Cole, near Grizzly Flat, El Dorado county; Pine Leaf mine, near Spanish Ranch, Plumas county; Ram Creek, near Brush Creek, Butte county; Irish Hill, near Oleta, Amador county. The following mining companies were authorized to build dams: Bull Neck, near Rancheria, Amador county; Mill Gulch, Amador county; Jay Bird, near Camptonville, Butte county; Wild Yankee, near Shady Run, Placer county; Meehan, near Aqueduct, Amador county; Trafton, near Yankee Jim's, Placer county.

H. A. LEE, Commissioner of Mines for the State of Colorado, has his whole force of inspectors at work in the Cripple Creek district. He says: "All the power vested in the Bureau of Mines is being used to promote legitimate mining and to discourage and expose wildcat mining corporations, that are always launched in times of great prosperity, such as the whole State is now enjoying. The official reports, which become a part of the puhlic records of the State, contain a cold statement of the facts, free from emhellishments of possibilities, from which can be determined whether a property should be classed as a mine, a prospect, or a 'wildcat' scheme. This information is official and for the protection of all who avail themselves of it."

REPRESENTATIVE MONDELL of Wyoming has introduced a hill providing for the manner of making application for a patent on mineral placer lands, where the same are located upon surveyed lands of the United States. The hill provides that any person, association, or association of persons, or their assigns, applying for a patent to any lands entered under the provisions of the revised statutes, where the same shall be upon surveyed lands of the United States, may obtain a patent hy filing in the proper land office an application therefor under oath, showing compliance with the statutes under which such entry was made, together with a description by legal subdivisions of the land sought to be patented. Notice of such application for a patent must be posted in a conspicuous place on the land embraced in the tract previous to filing the application for a patent, and the application shall be accompanied by the affidavit of at least two persons that such notice was posted. The Register of the Land Office must then publish the application at least once a week for at least sixty days in the newspaper nearest the claim. The claimant, at the time of filing the application, shall file with the Register an affidavit that at least $500 has been expended in improvements. If no adverse claims shall have been filed with the Register or Receiver of the proper land office at the expiration of sixty days' publication, the applicant shall be entitled to a patent upon payment of the legal price for such lands.

IN an article on the mineral industry of California, in the San Francisco *Call* of the 25th instant, the State Mineralogist estimates the number of mines operated and miners employed in twenty-three counties of this State in '95 as follows: Amador, mines operated, 110; miners employed, 700; Calaveras, mines operated, 245, miners employed, 1027; Contra Costa, mines operated, 4; miners employed, 113; Del Norte, mines operated, 40; miners employed, 93; Humholdt, mines operated, 37; miners employed, 272; Inyo, mines operated, 72; miners employed, 207; Lake, mines operated, 14; miners employed, 256; Lassen, mines operated, 7; miners employed, 50; Mariposa, mines operated, 117; miners employed, 542; Mendocino, mines operated, 14, miners employed, 15; Mono, mines operated, 26; miners employed, 142; Napa, mines operated, 24; miners employed, 356; Plumas, mines operated, 77; miners employed, 503; Sierra, mines operated, 56; miners employed, 600; San Benito, mines operated, 5; miners employed, 46; Sacramento, mines operated, 32; miners employed, 252; San Luis Obispo, mines operated, 12; miners employed, 102; Santa Barhara, mines operated, 11; miners employed, 77; Shasta mines operated, 99; miners employed, 833; Siskiyou, mines operated, 420; miners employed, 1771; Solano, mines operated, 13; miners employed, 72; Sonoma, mines operated, 31; miners employed, 306; Trinity, mines operated, 186, miners employed, 691; Tuolumne, mines 242; miners employed, 964; Ventura, mines operated, 12, miners employed, 60. To the list might he added Butte, mines operated, 61, miners employed, 475; El Dorado, mines operated, 74; miners employed, 545; Fresno mines operated, 40; miners employed, 275. Madera, mines operated, 21, miners employed, 178; Riverside, mines operated, 31; miners employed, 304; San Diego, mines operated, 52; miners employed, 418; San Bernardino, mines operated, 63; miners employed, 378; Yuba, mines operated, 37; miners employed, 320, making a total of 2285 mines operated and 12,943 miners employed.

IN the case of the Tyler vs. the Last Chance Judge Beatty, last week in the U. S. Circuit Court for Idaho, decided in favor of the latter company. The decision turned upon the question of priority, already decided by the higher courts in favor of the defendant, the matter having been reversed and remanded to that court for a new trial. The court holds that as to the Last Chance location the Tyler ledge cannot be followed downward farther than to the vertical plane through the located north side line of the Last Chance location, and that the defendant Last Chance Co. is, therefore, entitled to judgment against the plaintiff for the possession of the premises in dispute which lie hetween those planes which descend vertically from those two side lines of the Last Chance, which were located as its side lines. The larger portion of the decision is taken up with the discussion of a point similar to that which entered into the Amy-Silversmith case. In the latter case the Supreme Court decided that a claim in which the vein crossed both side lines had no extralateral rights. This point was raised by counsel for the Last Chance in the case just decided. The vein in the Tyler intersects one end line and one side line of the original location. As the Tyler claimed to hold the apex of the vein, and to be entitled to follow the ledge into and through the Last Chance ground, application of the Amy-Silversmith rule would shut it out, and counsel for the Last Chance maintained that if a claim had no extralateral rights when the vein crossed hoth side lines the same reasoning would exclude it from such rights if the vein intersected one end line and one side line, as in the case of the Tyler. On this point Judge Beatty holds against the contention of the Last Chance Co. He says: "The statute says the right to follow the ledge along its course underground shall he limited hy the planes passed through the two end lines, hut it is manifest that this rule cannot he followed when the apex of a ledge, before reaching the other end line, passes out of the side line, for it would give the locator more of the ledge underground than he has of apex. It would give him a portion of the ledge of which he does not hold the apex. To hold that his ledge shall be cut off hy the vertical plane of his side line is cutting off the right to follow it down which the law has given him. Instead of this, to establish at the point where the apex crosses the side line a vertical plane parallel to the plane of the side line cut by the apex, and allow him to follow the ledge on its dip between these two planes, is not violation of any provision of the statute, and gives the miner only those rights the statute intends he should have. The courts, hy the cases above cited, have so held, and it is now held that plaintiff can so follow its ledge as far as not in conflict with some prior right." Applying this rule to the Repuhlican Fraction, a small wedge-shaped piece of ground lying between the Last Chance and the Tyler, and belonging to the Last Chance people, Judge Beatty decides that the Tyler Co. can follow the ledge through that territory; this hecause the Tyler holds priority of location over the Repuhlican Fraction. The case was first tried in Boise, Idaho, in 1892, a verdict heing returned in favor of the Last Chance. At that trial a prior judgment secured hy the Last Chance against the Tyler, in which priority of location was decreed to be in the Last Chance, was admitted in evidence hy Judge Beatty. On this point he was overruled by the Court of Appeals. The case was tried again in 1893, resulting in a verdict in favor of the Tyler, which was confirmed hy the Court of Appeals. On a writ of certiorari the case was taken to the United States Supreme Court, where the Court of Appeals was overruled, Judge Beatty's original ruling in admitting the prior judgment heing indorsed. This decision remanded the case for new trial, with the above result.

A Letter From Hon. Tirey L. Ford.

To the Editor:—The editorial pages of your issue of the 21st inst. are given up almost exclusively to a comparison and discussion of the two proposed mineral land bills recently considered by the Executive Committee of the California Miners' Association, which proposed bills are set forth at length at pages 402 and 403 of the issue referred to. Your conclusion seems to be that the bill finally agreed upon by the Executive Committee is a complete surrender of the rights of the miners of this State; that it is "a travesty on justice;" that it would be better to "pass no bill at all than for the miners of California, in or out of convention, to stultify themselves by endorsing a piece of proposed legislation that defeats the very object it ostensibly is meant to secure."

Now, Mr. Editor, I do not question your sincerity, though I do suspect that you have been grossly misled as to the facts upon which you have based your conclusions; otherwise some very unusual results must follow. If the bill finally agreed upon be in fact a surrender of the rights of the miners, "a travesty on justice," as you say, then was President Neff most unfortunate in his selection of the members of the Executive Committe, for, upon such a basis, that committee must appear either as an aggregation of mental imbeciles or a band of conscienceless conspirators. Before, however, we proceed to condemn the action of men whose fidelity to the mining industry is attested by their long and faithful service in its behalf, it might be as well to see just what all this fuss is about.

The California Miners' Association, since its organization, has had three matters prominently before it for consideration, viz.: First, the rehabilitation of the hydraulic mining industry; Second, the revision of the mining laws relating to the manner of locating, holding and working mining ground, and the manner of determining disputes between agricultural and mineral claimants; and, Third, the segregation of the mineral lands within the railroad land grants of this State. These three matters are all of the utmost importance to the proper development of our mining industry, and the miners of California have looked to their association for the proper settlement of these questions.

Hydraulic mining received the first attention of the association, and both Congress and the State Legislature responded to our appeals. The State Legislature did all it could within the sphere of its limited jurisdiction, while Congress gave us an act that yet needs an appropriation to make it complete. That appropriation the miners are still clamoring for, and it is a part of our duty to heed their appeal in that regard. The matter of amending the mining laws so that contests as to the mineral or agricultural character of lands may be referred to the local courts in the respective counties wherein the disputed lands are situated, was also most forcibly urged upon the association.

While these matters were engaging the attention of the association and its committees, the mineral lands question, as related to the railroad land grants within this State, was brought to the attention of the association. The other two matters above referred to were at once dropped, or held in abeyance, rather, awaiting the settlement of the mineral land question. To the settlement of the latter question the association gave its entire attention. A special committee was appointed to attend to the matter, which committee was given plenary power and all the financial aid for which it asked. For a year prior to the annual meeting of the association last October this committee employed such means as it deemed proper to secure the segregation of the mineral lands from the railroad grants. It spent several thousand dollars in presentiug the matter to Congress, to the President and to the Interior Department. The chairman of the committee made a personal visit to Washington to lay the matter before the President. Finally an effort was made, by means of a written correspondence with Mr. W. H. Mills, to amicably adjust the matter with the railroad company. All this time the other matters above referred to were quietly sleeping and the miners were getting somewhat restless, in fact, quite restless. They couldn't understand why it was necessary to spend so much time on the mineral lands question to the exclusion of all other matters to which the association had directed its efforts.

Then came the annual meeting of October last. The then chairman of the Mineral Lands Committee publicly declined to longer serve in that capacity, and Mr. W. C. Ralston was appointed in his stead. The writer, against his own inclinations, but at the earnest solicitation of Mr. Neff, again accepted the chairmanship of the Committee on Legislation.

Congress was about to meet. It was of the highest importance that we should be ready with our measures at the earliest possible moment. The bills relating to hydraulic mining and the proposed changes in the mining laws had already been prepared by the Committee on Legislation and approved by the Association. It only needed a mineral lands bill to complete our preparations for an appeal to Congress. The writer, as chairman of the Legislative Committee, drafted a bill based on the Idaho-Montana Act, and presented the same to the Executive Committee for its approval. This bill became known as the "Committee Bill," and is the same bill published at page 402 of your issue of the 21st inst. Mr. Ralston moved that the bill thus presented be approved by the Executive Committee and forwarded to Congress for passage by that body. After considerable discussion, and before a vote was taken on Mr. Ralston's motion, Mr. Wright moved that the chairman of the Legislative Committee and the chairman of the Mineral Lands Committee be appointed a special committee to confer with the railroad authorities and ascertain their views with reference to the proposed legislation. The writer and Mr. Ralston thereupon, and in pursuance of the instructions contained in the above motion, communicated with Mr. Herrin, chief counsel of the Southern Pacific Company, submitted a copy of the "Committee Bill," and requested his endorsement thereof. Thereafter, through Mr. Singer, chief counsel for the Southern Pacific Land Department, the company submitted a bill as a substitute for the "Committee Bill." This bill was not acceptable to the special committee, and the writer thereupon drafted a bill which became the basis of subsequent consultations between the special committee and Mr. Singer. After some minor modifications, this bill was accepted by Mr. Singer on behalf of the railroad company. In communicating his acceptance of such bill, Mr. Singer stated that the company's officers did not deem any legislation upon the subject necessary; that the practical operation of the company's affairs, arising out of their land grants, had demonstrated the efficiency of the executive and judicial departments of our Government to properly and fairly consider all controversies arising therefrom. Mr. Singer concluded his letter as follows: "It is because the Association which you represent earnestly desires the passage of the proposed bill that the company's officers will withhold their opposition, and not because they desire the passage of that or any other bill upon the subject."

This bill was reported back to the Executive Committee by the special Committee on the 11th inst., at the most largely attended meeting the committee ever held, save at meetings held immediately upon the close of an annual session and before the members have departed for their homes. Twenty-four members of the Executive Committee were present and the proposed bill, which became known as the "substitute bill," was read at length, and then read and discussed section by section. Several amendments were added as the sections were under discussion, and it was near midnight before the committee adjourned. The following evening (the 12th) the committee met again, pursuant to adjournment, and voted, first, upon the "committee bill," which received but one affirmative vote, and, second, upon the "substitute bill," which received but one negative vote. Nineteen members were present when the final votes were taken, with President Neff in the chair.

Is the "substitute bill," thus approved by a practically unanimous vote of the committee, after mature deliberation and exhaustive discussion, a "travesty on justice" and a surrender of the rights of the miners of California?

PRESENT SYSTEM.

Under the present laws and regulations there is no method whereby large areas of land within the railroad grants may be examined and the mineral or non-mineral character thereof determined. This has been demonstrated by the futile efforts of the late Committee on Mineral Lands so to do. That committee, through its chairman, spent much time and money in filing and prosecuting protests covering large areas of land, but without avail. The protests thus filed were promptly declared insufficient under the present laws, and were accordingly dismissed. Under the laws and regulations as they now exist, the railroad companies, speaking now particularly with reference to the Central Pacific and the California and Oregon, have been accustomed to make selections from time to time, and to make applications for patents for the land thus selected. The miner had no knowledge as to when these selections and applications would be made prior to the publication of notice thereof, and the notice itself was wholly inadequate. Often the miner, living in the mountain regions, far removed from the populous centers, would never know of the company's application until the time for filing protests had already expired. Occasional individual protests were filed, but no general protests could be successfully maintained, as we have already seen. Furthermore, such protests as did reach a hearing in the land office threw upon the contestant the burden of proof and compelled him to establish affirmatively not alone the mineral character of the land, but that each forty-acre subdivision contained mineral in paying quantities. And all this the contestant (the miner) was compelled to do at his own expense. He must furnish his own proof, procure the attendance of his witnesses, and employ counsel to prosecute the protest, and pay for it all out of his own pocket.

PROPOSED SYSTEM.

The "substitute bill" changes all this. In order to settle the matter once and for all, so that the miner may know that when he goes onto a piece of land he will not be disturbed by any further inquiries as to its mineral or non-mineral character, it is proposed that a complete list of all unpatented railroad lands, described by legal subdivisions, shall be published for sixty days in each county wherein any railroad lands are situated, so that ample notice may be given as to what are and what are not railroad lands. The passage of the act will itself be additional notice of the proceedings to be taken. In fact, the necessary preparations may be begun at once, if deemed necessary, and with that end in view the chairman of the Committee on Mineral Lands has already been allowed a clerk to secure the information necessary to enable the committee to file the requisite protests. At the proper time will come the filing of protests, which, so far as the association is concerned, will be looked after by its Committee on Mineral Lands. Any person, however, may file a protest. These protests, whether filed on behalf of the association or by an individual, may be wholly upon belief, the protestant being required to do no more than to detail the facts upon which such belief is founded. Certainly a broader liberality could not be asked by any fair-minded man. Knowledge of minerals in paying quantities, or otherwise, is not required. The Committee on Mineral Lands, through its selected agent or agents, will simply state that such and such lands are believed to be valuable for the minerals therein contained, and then state the facts upon which such belief is founded. In this way it will be an easy matter for the Mineral Lands Committee to cover with protests all lands that are even probably mineral, and thus cause such lands to be examined and classified in accordance with the provisions of the proposed bill.

Upon the filing of the required protests, it is made compulsory upon the Secretary of the Interior to suspend the issuance of patents as to all lands covered by such protests. The proposed bill then provides, in express terms, that "no lands so suspended shall be patented to any railroad company until, if at all, after the non-mineral character thereof shall have been established by a preponderance of proof in the manner hereinafter provided."

Under the present system the burden is upon the contestant (the miner) to establish the *mineral* character of the land. Under the proposed bill the burden is on the railroad company to establish its *non-mineral* character. In other words, the mere filing of the protest will stamp the land protested with a mineral character, and the railroad company, in order to get a patent therefor, will have to "prove the mineral off," as the miners say, and this it must do by a "preponderance of proof."

The protests being filed, the rest is easy and simple. The Government furnishes three commissioners for each land district to examine the land protested, and to testify concerning the same. They are also to procure the attendance of other witnesses and to introduce any competent proof. Any person interested may also introduce evidence at the hearings. The President also appoints an attorney for each land district wherein hearings are ordered, who must be a resident of the district for which he is appointed and whose duty it shall be "to appear and maintain the mineral character of all the lands subject of the hearing."

In the matter of evidence in support of the mineral character of the protested lands, the door for its admission is opened as wide as the most radical mineral advocate has ever suggested. The exact language of the proposed bill in this regard is as follows:

"That at such hearings evidence may be introduced by any person interested to show that any of such lands have, *or probably will have*, a market value by reason of the minerals which they contain; or that they show such indications of deposits of valuable minerals as would induce a miner to spend his time or money upon them with the reasonable expectation of finding mineral in paying quantities; or that such lands, from their geological formation, or location in a well defined mineral belt, or their situation or propinquity or relation to known mineral lands, are, *or probably will be*, valuable for the minerals therein; and all these matters shall be considered in determining the mineral or non-mineral character of such lands, and in classifying the same."

It could scarcely be claimed that such evidence is calculated to work any serious hardship upon the miner.

To sum up, the proposed bill provides:

1. For the filing of general protests by any person whomsoever, concerning any lands known, *or believed*, to be mineral.

2. That the lands thus protested shall be deemed mineral, and the patenting thereof suspended until their character can be finally determined.

3. That, after the filing of the protests, all expenses attending the examination and classification of the protested land shall be borne by the general Government, including the employment of special counsel to defend the mineral character of the land.

4. That the burden of proof shall be upon the railroad company and not upon the contestant as at present.

The fact is, the "substitute bill" provides for an expeditious and equitable adjustment of the mineral lands controversy. It provides for the establishment of every right the miners have ever claimed in relation to the contested character of railroad lands, and provides that the work they have heretofore carried on at private expense and under burdeasome difficulties, shall be undertaken by the general Government, as it ought to be. The work of classification would be pushed to a speedy conclusion and the miner would then rest in the conscious security of the validity of his mineral title.

IDAHO-MONTANA ACT.

The "committee bill," which is based on the Idaho-Montana act, would, of course, accomplish precisely the same ultimate results. It is apparent, however, that the "substitute bill" provides a more expeditious method of procedure and would, moreover, entail less of labor and expense upon the association. Under the "committee bill" a commission would examine all the railroad land in the State, take testimony with reference thereto, and report its character to the local land office. The decision of the commission is only *prima facie*, however, and the land is still subject to protest, besides which the report of the commission is subject to review by the Secretary of the Interior, to whom all the testimony must be forwarded. The railroad company would be at liberty to protest against any report of the commission and thus compel the association to defend the mineral character of the protested land. In such event it is provided that the United States Attorney or his assistant shall represent the Government at the hearings in the local land offices, but any evidence the association might desire to introduce would have to be procured at private expense. Under either bill the ultimate determination of the mineral or non-mineral character of the land examined would rest with the officers of the Land Department.

PROTESTS UNDER SUBSTITUTE BILL.

Your most serious objection to the substitute bill seems to be directed to the requirement that the protests "must fully set forth in detail the facts upon which such knowledge or belief is founded"—that is, the knowledge or belief as to the mineral character of the land protested. This provision was the subject of careful consideration both by the special committee that reported the bill and by the Executive Committee to whom it was reported. While the section containing the above provision was under discussion in the Executive Committee, some one suggested that it might be well to modify the above-quoted language by striking out the words "in detail." No motion to that effect was made, however, but in response to such suggestion Mr. John McMurray of Trinity, a prominent mining man and former State Senator, very aptly said that if the miners could not state the reasons upon which their belief as to the mineral character of any particular tract of land was founded, they should not ask such land to be declared mineral.

WHY A PROTEST IS REQUIRED.

The objections made by Mr. Singer on behalf of the railroad company to the "committee bill" were: 1. That three commissioners were to be appointed for the entire State who were to be their own judges as to the time within which their labors were to be completed; and 2, That all the railroad lands in California were to be made the subject of examination, the larger portion of which were admittedly non-mineral. To obviate the first objection, provision was made for three commissioners in each land district. In answer to the second objection, the special committee informed Mr. Singer that they had no desire to make any lands the subject of examination other than such as might be reasonably believed to be mineral in character. Various methods were then proposed for limiting the inquiry to the class of lands suggested, and finally it was agreed that the miners should indicate, by means of protests, the lands they desired to have examined and classified; that such protests might be made upon belief only; but, in order to show the good faith of the miner, he must set forth his reasons for such belief.

Such is the origin of the provision in question, which, as can be readily seen, will tend to expedite the work by limiting the investigation to such lands as the miner may desire to have examined and classified.

It is not claimed that the "substitute bill" will produce any better or different results than would the "committee bill," either of which would be satisfactory to the miners. It is clear, however, that the work will be more expeditiously done under the "substitute bill" and with less labor and expense to the miners than under the "committee bill"; and expedition is deemed of much importance by all concerned for the reason that mineral titles within the limits of the railroad grants must remain more or less in an uncertain state until the entire matter is definitely determined.

Now, Mr. Editor, permit me to say in conclusion that this is too grave a matter to be lightly cast aside by mere assertions of disapproval. To say broadly, and without specific reasons therefor, that the "substitute bill" is a "travesty on justice," or that it will "defeat the very object sought to be accomplished," argues nothing, unless it be a lack of argument. The miners of this State are patient and law-abiding people, but they are intelligent as well, and they have made up their minds that it is about time this mineral lands question was finally disposed of. There are other matters affecting the mining industry concerning which the miners of California are most deeply concerned and in relation to which the association is expected to take some energetic action. The miners expect us to stop our apparent wrangling and proceed to business. In short, they want less dress parade and more active service. Our duty in the present instance is plain, and our fidelity to the miners' cause will be measured by the energy that characterizes our support of the legislation now so eagerly demanded in behalf of a re-awakening industry. Respectfully yours,

TIREY L. FORD,
Chairman Committee on Legislation, California Miners' Association.

Notes on Gold Milling in California.

NUMBER VII.

By E. B. PRESTON, M. E., Field Assistant State Mining Bureau.*

In dressing the apron plates prior to starting the stamps, they are first washed down with the hose, to remove all particles of coarse sand which might otherwise scratch the plate during the subsequent dressing, then rubbed with a brush, using, if necessary, some fine tailings sand to remove all spots or stains. During this part of the operation the brush is moistened with different chemicals, according to the prefereuce of the millman; some use weak cyanide of potassium; others use strong brine, with a small addition of sulphuric acid; also sal ammoniac, or soda, or lye, besides other combinations. In many cases these prescriptions are carefully guarded by their possessors as trade secrets, and are considered the basis of all the success the owner has achieved in his business. Anything that will give the plate a clean surface, free from oxidation stains, and retain for the quicksilver its bright condition, is useful in this respect. The main point to achieve success is to always keep the amalgam on the plate bright, and of the right consistency, and this art can only be perfectly acquired by actual practice around the battery and plates. After the plate has been thoroughly cleaned, quicksilver is thinly sprinkled over the entire surface, through a cloth, and spread evenly by means of a brush or piece of blanket, and finally the surface gone over with a soft broom or brush, from side to side; this leaves the amalgam remaining on the plate with fine ridges parallel to the screen.

Among the plate devices used in California mills, which may take the place of the apron plates, or may follow them, is a late invention known as the Gold King Amalgamator. It consists of an iron cylinder, or drum, 6 feet long aud 12½ inches in diameter, divided lengthwise into two equal parts, hinged together, and capable of being locked. Fitting tight inside of the cylinder are two corresponding semi-cylindrical silver plates, each with two longitudinal ribs set radially, at one-third distance apart and about 3 inches deep. The upper end of the cylinder is furnished, around the circumference, with tooth-gearing, into which fits a spur wheel with a four-to-one transmission, driven by a 12-inch pulley. In the center of this end is a 3-inch feed opening, through which the pulp is dropped into the revolving cylinder. A trunnion at the lower end rests in a slide bearing, that permits of fixing the grade to he given the cylinder by means of set screws. The machine makes forty revolutions per minute, the pulp requiring about 3½ minutes to pass through the machine before being discharged. It is run by less than ½ H. P., and is easily set up. The pulp, when dropped into the closed cylinder, is caught by one of the ribs and raised to the highest point, when it drops, to be again taken up by the next rib, advancing at the same time a short distance ahead. The discharge is through the center at the lower end of the cylinder. From 15 to 20 tons can be passed through in a day; or, for a larger sized machine, from 25 to 40 tons.

Where concentrators are used in the mill, the sluice plates that follow the aprons are usually not over 8 feet in length and from 16 to 20 inches wide, with less grade than the apron. This latter point is reversed in some mills, and the sluice plates are comparatively steep.

Between the aprons and the sluice boxes a drop box is placed, into which the pulp from the aprons discharges; there is one to each apron, or one for two adjoining ones. These boxes are 1 foot wide and about 10 inches deep, with flat or partly sloping bottoms; these latter, generally where one box is used for two aprons, the bottoms sloping from each end across the width of the apron, toward a central part, where the bottom is level, and from whence it passes by overflow to the sluice plates. These sluice plates are in short lengths, and are either laid overlapping or screwed down to form a continuous sheet, and are prepared and treated in the same manner as the aprons. Of late years a useful addition is being made to the plates in the form of a shaking plate, of the same width as the aprons, and immediately below them. It is either suspended or on a movable frame, and is given an end or side-shaking motion and light grade; for an end shake the motion is imparted by a cam with ¾-inch stroke, and 200 strokes per minute. The correct strokes for these plates must be determined at each mill by experiment. Their efficiency was demonstrated in one mill, where the pulp passed over two successive apron plates, and then to the shaking plate, which accumulated a greater amount of amalgam than the second apron.

Amalgam Traps.—To retain any quicksilver or small particles of amalgam that escape inadvertently while dressing or cleaning the plates, traps are generally placed below the sluice plates, and are made of various patterns. The general idea is for the pulp to drop to the bottom of a deep vessel and flow out at or near the upper edge; in some cases passing over a series of inclined shelves or copper plates during the descent. A simple and very efficient contrivance for an amalgam trap is to suspend a narrow box by one end and attach the opposite end to a rod connected by a pin to an eccentric, through which it receives a gentle shaking motion in the direction of its long side. The tailings are introduced into a stationary box immediately above, from whence, diluted with fresh water, the pulp passes over the top of a partition in an even sheet to the suspended box below. The proper motion for this lower box must be found by experimentiug, for which purpose the end of the rod is supplied with a series of holes, to shorten or lengthen the stroke. The motion should be just sufficient to keep the pulp suspended like quicksand, without splashing or caking on the bottom.

Amalgamating.—Quicksilver is charged by hand into the mortars through the throat, at stated intervals, with a small wooden spoon. Automatic quicksilver feeders have been invented that are worked from the cam shaft in such a manner that, at stated intervals, a little cup on a ratchet wheel, in revolving, dips quicksilver from a reservoir and drops it through a tube into the mortar. This insures absolute regularity; but for some reason they do not find much application in California. Retorted or new quicksilver should be used for charging as well as for dressing the plates. It is a good plan to keep the quicksilver used for these purposes covered with a weak solution of cyanide of potassium.

Quantity of Quicksilver.—To form some idea of the amount of mercury necessary to be introduced when handling an ore, the value of which is not known, a horn spoon test of a weighed quantity is made, and the quantity of gold decided. Gold alloyed with an appreciable amount of silver requires a larger addition of quicksilver than does a purer gold. One ounce of gold of average fineness can be amalgamated with 1 ounce of quicksilver, but for a safety margin an allowance must be made, so that 2 ounces will answer better; and with extremely finely divided gold, 2½ or 3 ounces. If the stamps have a duty of 2 tons each, the amount of mercury requisite to amalgamate the gold contained in one ton of ore should be divided into five parts and introduced at half-hour intervals. If the ore be of low grade, the necessary portion may be added every hour; as the value increases, the stated intervals for charging should be reduced. The larger proportion of California gold ores receive mercury every half hour.

The skilled millman judges from the condition of his plates as to whether he is charging correctly. He places his finger on the apron plate, and if the accumulated amalgam gives to a gentle resistance, and has a putty-like feeling, the condition is about right; when hard to move, he must increase the charge; or, if thin, reduce it. The harder the amalgam, the more it assumes a dead-white color. The matter of correct charging of the mercury requires a constant watching, as on this depends the success of battery amalgamation; hence, the ore should be frequently tested with the horn spoon.

Amalgam retained on the inside battery plates weighs heavier, for the bulk, than the apron amalgam. There is a diversity of opiniou among millmen as to how often the amalgam accumulated on the aprons and sluices should be removed. Thus it is found in the California milling practices that aprons are scraped as often as twice a day in some mills, while in others it is allowed to accumulate from one clean-up day to the next, which sometimes means once a month. Personal experimeuts by the writer, conducted in various mills, invariably showed a yield of more amalgam from the more frequent removal of the accumulations, but as the clean-up of the apron would require the cessation of crushing, such frequent stoppages would materially lessen the output. To avoid this, as the upper 18 inches of the apron plate retains about 75 per cent of all the amalgam on it, this much of the apron plate may be made separate from the rest, and held in place by wooden buttons on the side, so that it can be removed at any time while the battery is at work, and an extra plate, provided for the purpose, slipped in its place. Once or twice in the twenty-four hours it is advisable to hang up the stamps, one battery at a time, and dress-over the surface of the apron plate, sprinkling, if necessary, a little fresh mercury, and brushing it into the adhering amalgam, after which the amalgam should be evenly spread out again. This takes but a very few minutes. Frequently, when dressing a plate, a very fine coating of brownish or grayish color can be seen adhering to the surface, which, on the application of the brush, is easily detached and thoughtlessly washed off. If this be examined under the glass it will be found to contain considerable gold, hence should be gathered carefully in the gold pan.

To remove the amalgam from the plates, the stamps are hung up, the battery water shut off, and the front of the screeu and plates hosed off to remove any sand which would scratch the plate. The surface of the plate is softened by the addition of quicksilver until the amalgam moves readily. Then, commencing at the bottom and working upward, with a piece of rubber, or rubber belting, 4 inches long, with square edges, the amalgam is pushed ahead to the upper end of the apron, gathered in a heap, and transferred to a pan or bowl by means of a scoop. The amalgam is taken to the clean-up room for further cleansing.

Where the amalgam has been retained on the plate for any length of time, as during an entire run, it requires a chisel or caseknife to remove it thoroughly, care being taken not to scratch the plate. In scraping a plate it is not advisable to remove ("skin") all the amalgam; enough should be left to form a thin coating, when ready to commence crushing again.

All mills experience more or less loss of quicksilver, partly through careless handling in dressing the plates, but also from the "flouring" of the mercury (breaking up into minute globules) after charging in the battery. This loss is extremely variable in the different mills, depending on the nature of the ore, high discharge, and low temperature of the battery water. Ores carrying much talc, black oxide of manganese, galena, or arsenical pyrites, cause a good deal of flouring of the mercury. A further cause of loss is through incomplete retorting, a certain amount of mercury being retained in the bullion, which is volatilized in the subsequent melting. One-half ounce to the ton of ore may be taken as near the average loss for California mills, although in a few cases these figures are doubled.

As the amalgam retained in the battery is less liable to loss than that portion adhering to the outside plates, the aim of the millman is to retain the largest proportion inside the screens. The coarseness of the gold has a good deal to do in this direction, as well as the splash and height of discharge. In some mills as high as 80 per cent of the total yield of amalgam will be found in the battery; it is always greatest with the same grade of gold, where the most copper plate surface is found inside the battery. The average proportions of amalgam retained in this country may be stated as two-thirds in the battery as against one-third on the (outside) plates, depending, of course, on the character of the gold in each district.

As the proper conditiou of the mercury is a matter of importance to the millman, it is well to become familiar with its different phases. Pure mercury is bright, quick, and does not change its appearance on exposure to the air at ordinary temperature, but evaporates slightly. As the temperature decreases it becomes stiffer, and at low temperature assumes a more leaden appearance; in raising the temperature it becomes more liquid. At 60° Fahr. it emits vapor sufficient to discolor a bright piece of gold when suspended over it in a closed vessel. Pure mercury, if dropped into a porcelain dish or on a table, will form into spherical globules, whereas the impure metal breaks into pear-shaped drops, and, if very impure, the particles drag a tail when moved. If containing lead, a skin of metal will remain on the finger nails when passing the hand through the surface. The introduction of grease or other unctious substances, like clay and talc, incline the metal to separate into extremely fine globules—flouring. Quicksilver is attacked by heated concentrated sulphuric acid, but is not affected by it when diluted. Muriatic acid likewise does not affect it. Nitric acid attacks it and forms nitrate of mercury, a white compound. Quicksilver that has been used in gold milling dissolves and retains a certain amount of gold, which remains with it, even after retorting. If quicksilver of this description be left for months undisturbed in a cold place and then carefully poured or siphoned off, a network of fine, needle-shaped crystals of amalgam will be found in the bottom of the vessel, derived from this gold held in solution.

(To be Continued.)

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Fire Assays.

H. Van F. Furman, chief chemist at the Denver branch mint, writes as follows as to the general accuracy of the fire assay methods:

There is a popular impression among many miners and others that the fire assay (the usual method) for gold and silver gives results which are not only too low, but that the method frequently gives but a small proportion of the precious metal contents of our ores.

Every mining community, and especially Cripple Creek, at the present time is inundated with "process men," who claim that they, by their own particular pet process, can save far more than the assay value of the ore, "as the fire assay is no good." Practical chemists and metallurgists, of course, pay no attention to such statements, as the discussion is an old one, and the accuracy of the fire assay for gold and silver has been so frequently tested and demoustrated that a discussion at this time would seem futile. While there is some reason for the belief that the fire assay does not return the full precious metal contents of the ore, the truth remains that it gives results which, considered from a commercial standpoint, are most excellent, and so near the actual contents in these metals that the writer doubts if any greater degree of accuracy is attained in the valuation of commercial products than that which is the result of the present Colorado practice for the assay and valuation of ores.

Under the English system for the purchase of base

metals (copper and lead) the practice prevails of making an assay as the Cornish copper assay, which is supposed to represent the percentage of base metal which will be obtained in the actual smelting operation. Such a system does not prevail in the United States, and as regards the assay for the precious metals the results obtained are supposed to actually represent the amount of gold and silver in the ore, as nearly as possible by commercial methods, the inevitable losses in smelting being allowed for by proper deductions from the price paid for the ore.

While losses of the precious metals do occur in the fire assay, when the assay is properly conducted these losses are quite small and not nearly as great as many suppose. In a recent series of experiments conducted by the writer the total actual loss of silver in crucible assays was 2.58 per cent. This was the average of a large number of experiments on a variety of material, the charges being made up so as to represent nearly every variety of ore likely to be encountered. The loss of gold was but 0.3 per cent. In another series of experiments by the scorification method the silver loss was 2.54 per cent, and the gold loss was 0.6 per cent. These assays were all run in the ordinary manner such as would prevail in good commercial work. Recently the writer examined three samples of Cripple Creek ore, with the following results: By crucible assays—No. 1, 39.0 and 39.5 ounces gold per ton; No. 2, 9.0 ounces gold per ton; No. 3, 22.5 ounces gold per ton. By scorification assay—No. 1, 39.5 and 39.0 ounces gold per ton; No. 2, 9.0 and 8.8 ounces gold per ton; No. 3, 21.8 and 22.0 ounces gold per ton. Before making these assays the samples were divided, and half of each was sent to an eminent Eastern chemist, who determined the gold contents by chemical analysis, with the following results: No. 1, 39.0 ounces; No. 2, 8.8 ounces; No. 3, 22.0 ounces gold per ton.

As the chemical analysis should have given all the gold present, the results show that the fire assay may be relied upon. This ore was a high-grade telluride, which is popularly supposed to be about the most difficult ore to assay and obtain correct results by the fire methods. The slightly higher results obtained by the fire method will be readily understood by practical assayers.

The Small Invention.

The purchasers of the telephones made by a certain manufacturer in Chicago probably appreciate the purpose that influenced him to write: "Every conceivable method of accomplishing mechanically or electrically this or that result is covered by a patent or patents on devices to that end. A mechanic of ordinary intelligence after a week's time in an electrical manufactory suggests to his superior a better design than the one in use. He is told that his suggested method is patented. Surprised, he suggests another way, and learns that this way is also patented, and so on through every new suggestion. In the writer's factory at least five hundred suggestions of improvements in one way or another have been offered by the ordinary workmen, and found upon examination already subjected to the dignity of patent claims, usually by a professional patentee. Of course, this fact would indicate absence of the elements of invention, and that the patents were of little legal value if litigated:" in other words, all the improvements which he would like to give the dear public the benefit of they already enjoy. But he also says: "No less than ninety per cent of the patents issued on telephonic apparatus are for simple improvements in the art, and not entitled to the dignity of invention. There are not more than ten in one hundred of the patents that a good mechanic, familiar with the art of telephony, could not have devised. It is quite easy to believe that of these ten about two-thirds are simple adaptations of old devices to the new art. Of the balance, about one-half are not patented in the name of the real inventor, and, if the two per cent remaining are, it is safe to assume that no considerable financial reward accrues to the inventor in more than one case out of two. This assumption resolves itself into a statement that only one invention in one hundred brings financial success to the real inventor. Searching this we find matter for serious thought. If ninety per cent of the patents are not real inventions, then that percentage of legal harriers stands in the way of progress in the art. Innumerable device patents are bought up by large concerns, or obtained at their instance, at a small outlay, and these patents are used to monopolize one or another branch of the art."

Surely there is an old familiar sound to that criticism, and memory goeth back to the days when Columbus stood the egg on the table and silenced his envious critics. Such criticisms are very tiresome. It would seem that a man intrusted with the management of a manufacturing plant ought to be able to perceive that there is no way of sifting out from the few real inventions those applications which he would consider too insignificant for patent: because it is manifest that the measure or standard must be independent of the whim of him who applies it.

The statute still authorizes the Commissioner of Patents to reject if, "in his opinion," the thing is "not of sufficient importance," etc. The Supreme Court, however, long ago settled that question by deciding that want of novelty is the only justification for rejection, and no application has been rejected upon any other ground, for more than a generation, with the sole exception of applications for perpetual motions or matters clearly immoral. Probably he has never reflected on the subject deeply enough to discover the difficulty if not the impossibility of formulating any better rule than the one in use for the past half century. Under the authority given by the letter of the statute the great inventions of the age would not have been patented. Morse, Howe, McCormick, Edison and Bell would have been rejected for the reason that the telegraph, sewing machine, reaper, phonograph, or telephone had no believers among the public when they were first proposed; and this list might be indefinitely prolonged. In fact, as this loose critic may easily see, every invention which is presented at the Patent Office is supposed to represent something about which neither the people nor the examiner ever before heard. In more than half the cases this proves to be true. Now, would the critic care to assert such infallibility for his judgment that he would undertake the selection of the good from the poor electrical contrivances which may be brought out in the year, by simple inspection and without opportunity for thorough test? If he would be willing to trust himself, I doubt if his fellowmen would share in his confidence. When an invention is presented at the Patent Office the examiner may or may not appreciate it. The chances are that he cannot, and in either case it would be cruel to submit the rights and interests of the originators of new things to the fallible judgment of any man or set of men. But when it is submitted to the test of novelty the case is changed. The officer can then dismiss his individual opinions and simply search for the same thing among prior inventions. That he can be impartial about.

Possibly the critic is right in stating that "Ninety per cent of the improvements on telephonic apparatus are for simple improvements in the art." I can very well remember the time when there were no telephones, and I am pretty well assured that from the crude and worthless instrument exhibited by Bell in 1876 to the instrument of to-day, which we all know is very far from being perfect, the advance has been by a multitude of small steps, none of which this critic may consider worthy of a patent. Yet no one will deny the importance of the aggregate, while it would be pretty difficult to decide which single one could be admitted. He may be correct in saying that any good mechanic might have devised either one of these things as well as the men who did devise them. Still as one did and the other didn't think to do so, there is a manifest difference in the thought, which is the essence of the invention. Here is where men of his way of thinking meet shipwreck. They ignore the fact that the invention resides in the perception that an improvement is possible, and the thought how it may be accomplished. They look at the wood or iron of the implement and say: "Pooh! anybody could do that." Perhaps he could if he had only *thought* of it. All inventions adapt old things to new uses, and it makes little difference how small or how large is the change which "adapts the old device to the new art," so long as the adaptation is useful and the public gets the benefit of it. This critic also loses sight of the fact that benefit to the public is the root of the patent agreement. The profit of inventor or manufacturer does not enter into the matter to the slightest degree. The only question is as to novelty, utility to the public after the expiration of the patent being assumed and conceded.

His classification of inventors and conclusion that a large percentage are fraudulent, and that not more than one per cent brings any financial reward, is extravagant and wild. When Mr. Thatcher was Commissioner of Patents he made an extensive inquiry and concluded that more than one-half of all the patents issued were financially remunerative. From my own knowledge I am satisfied that a far larger proportion than that are remunerative, and I think my experience justifies me in saying that the percentage of fraudulent applications is very small. I know many concerns who employ professional inventors, but the idea of employing professional patentees (perjurers) is a new one to me, and I cannot comprehend the motives which would lead a proprietor to thus put himself in the hands of a rascal.

That there is rascality connected with patents need not be denied. It would be hard to find any field of human endeavor where rascality does not get in. But the inducements to commit perjury for the purpose of cutting somebody out of an invention the value of which is always problematical are generally pretty small.

I think that it is a great mistake to belittle small inventions. The changed location of a pin which converts failure into success is not a small matter. Neither was the wooden ball and rubber string which so interested the people that they rewarded the inventor with an independent fortune. Things in this line are to be judged by the results they produce, and not by their magnitude in the eyes of a would-be critic of limited experience.—Electrical Engineering.

Copper Refining by Electricity.

By H. C. Carneau.

Copper as received at the refining works is in a comparatively pure state: it is in plate bars 1.5x 1x.5 feet, weighing about 125 lbs., and is placed in furnaces and heated to a bright redness. When they have reached the desired temperature, they are rolled in return rollers (generally of five sizes) until the plates are about twenty-three feet long, one inch thick and one foot wide. As this strip of metal goes out of the last roll, it is passed through a trough of cold water to cool it quickly and prevent formation of oxide. These strips are then cut into small plates about a foot and one-half long and one foot wide; the rough edges are also cut off, and when sufficient scrap accumulates, it is reheated and rerolled.

Two of these small plates are put in suitable, grooved, wooden racks, which may be used over again, two or three times.

These racks, when filled, are brought to the electrical depositing room, containing vats in series, each vat having a capacity of fifteen to twenty plate racks. There are generally twenty vats to a series, but the number varies. These vats are filled with a solution of medium strength of blue vitrol, sulphate of copper, which acts as a carrier for the copper in process of deposition. The copper sulphate solution is constantly kept moving and renewed by hydraulic pumps at the end of each series of vats and by means of a system of pipes and gutter.

The racks are now placed in these vats and electric wires attached. The current from the adjoining dynamo room is turned on and the copper begins to deposit from the positive to the negative side, or *vice versa*, according to the direction of the current. This deposition is allowed to go on, unwatched, for a period of fourteen days, at the end of which time the copper plates have completely redeposited themselves and the copper is almost pure. While the deposition is going on the impurities, as gold, silver, sulphur, dirt and a little copper, etc., fall to the bottom and form an important by-product.

The copper sulphate solution is now drawn off from the vats, and the plates are washed with a strong shower of water to wash off any slime that may have adhered to them. The plates are then removed from the racks and are brought to the furnace room. Here the copper is melted and any remaining impurities removed by obtaining the right temperature and pitch (*i. e.*, the right amount of oxygen), the arrival at which point the experienced eye of the operator notes.

The copper is then cast into ingots and bars, which, when sufficiently cool to form a homogeneous solid, are dumped into troughs of cold water to cool them quickly and thus prevent the formation of any oxide.

The ingots weigh from fourteen to sixteen pounds and are used for making brass, bronze and other commercial articles. The bars weigh much more than the ingots, generally about 135 lbs.

Treatment of the Slime.—In copper containing gold and silver, the treatment of the slime is one of the most important parts of the refining. The recovery of the gold and silver pays for the running of a refinery and the copper represents the profit.

The slime is first scraped from the bottom of the vats and put into slime barrels, in which it is taken to the slime house, a building generally of three or four stories.

The slime is first made of a thin, mud-like consistency. It is then run into a swiftly revolving centrifugal, which has inside a forty-mesh sieve. This sieve allows all the gold and silver, some dirt and a little finely divided copper to pass through, while it retains the wooden chips, most of the dirt and copper. That which is retained is rejected, while that which passes through is run into a vat, where it is boiled by steam with a five per cent solution of oil of vitriol, until all the copper is dissolved as copper sulphate, the solution of the vitrol being too weak to dissolve any silver as silver sulphate. This, with the gold, settles to the bottom in its elementary state. The mass is then filtered on coarse cloth or canvas filters and washed two or three times to free of copper sulphate and dirt. The residual silver and gold are cast into bars, which, however, contain copper and other impurities. These bars are then dissolved in sulphuric acid, the silver going into solution as silver sulphate; the gold unacted upon by acid, falls to the bottom of the vat in a finely divided state. It is then gathered up, filtered and washed free of silver sulphate, etc.; it is then dried on pans, and when sufficient has accumulated, is cast into bars.

The silver is recovered by putting into the solution bars of copper. The copper being more electropositive than the silver, supplants it in the solution of the sulphate, and the free silver deposits on the copper bars. This reaction is allowed to go on until all the silver is deposited or until the solution gives no white precipitate (silver chloride) with a drop of hydrochloric acid. The free silver is then filtered and washed free of copper sulphate. It is finally dried on pans and cast into convenient bars.

Mechanical Progress.

What Edison Thinks.

Talking of horseless carriages, T. A. Edison thinks that the horse is doomed, yet this animal shows a greater economy of force than man, 70 per cent of the energy of the horse being available for work. "But the horseless vehicle is the coming wonder. The bicycle, which ten years ago was a curiosity, is now a necessity. It is found everywhere. Ten years from now you will be able to buy a horseless vehicle for what you would have to pay to-day for a wagon and a pair of horses. The money spent for the keeping of the horses will be saved, and the danger to life will be much reduced."

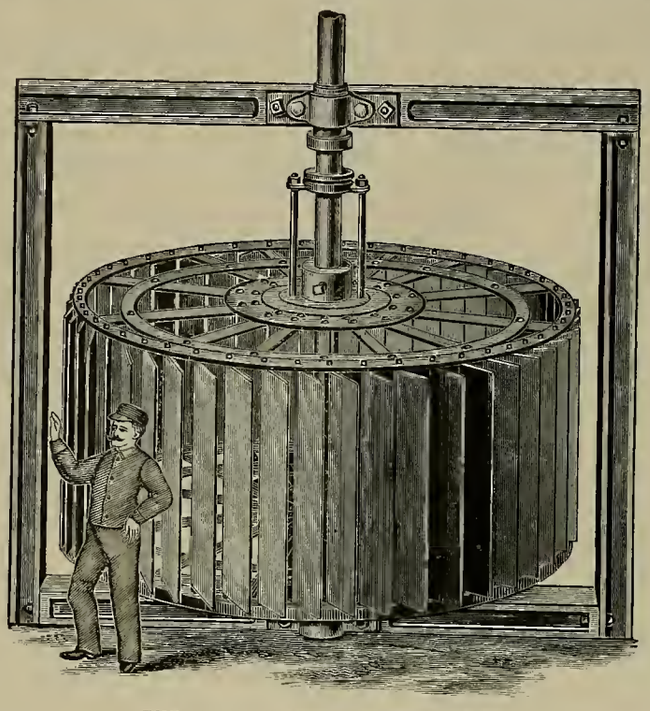
"Will these vehicles be run by electricity?"

"I don't think so," said Mr. Edison. "As it looks at present, it would seem more likely that they will be run by a gasoline or naphtha motor of some kind. It is quite possible, however, that an electrical storage battery will be discovered which will prove more economical, but at present the gasoline or naphtha motor looks more promising. It is only a question of a short time when the carriages and trucks of every large city will be run with motors. The expense of keeping and feeding horses in a city is very great, and all this will be done away with, just as the cable and trolley cars have dispensed with horses. Every invention of this kind which is made adds to the general wealth by introducing a system of greater economy of force. A great invention which facilitates commerce enriches a country just as much as the discovery of vast hoards of gold."

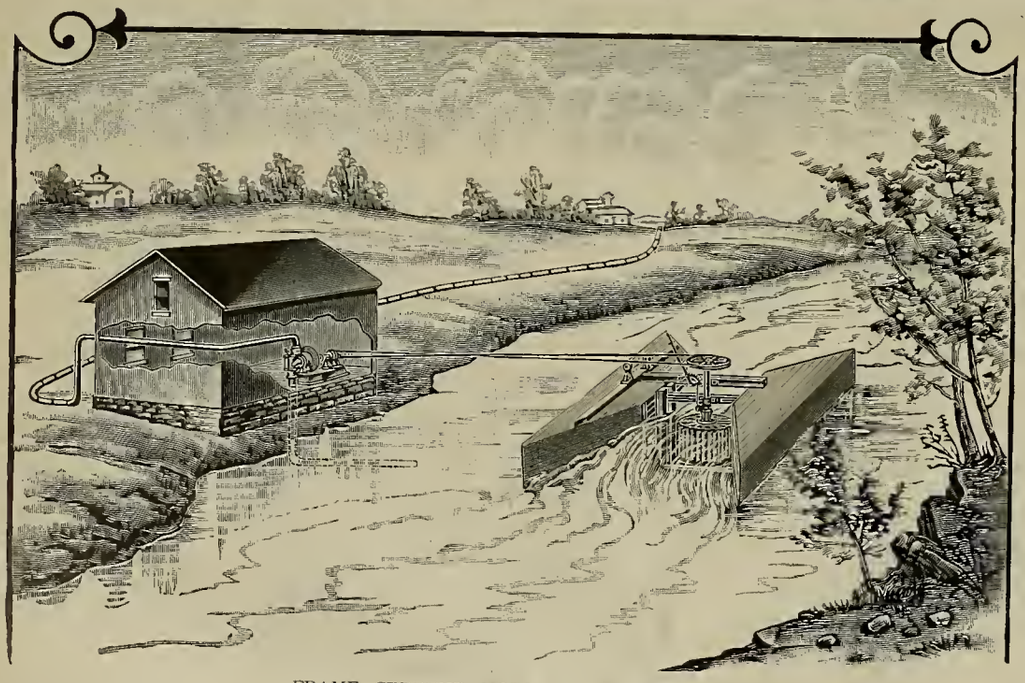
Frame Water Wheel.

A new wheel is shortly to be placed on the Columbia river, in Oregon, for irrigation purposes, which involves an idea that the inventor thiuks will prove of value. On the proposition that a dam in no wise increases the power or efficiency in a stream of water, and that if a wheel could be built whose blade surface would be exposed to the force of the water in its banks, it would bring into immediate use the power of a navigable stream, the inventor, A. B. Frame, of Boyden, Iowa, has built a wheel, protected against damage by ice and drift iu its construction, and which is meant to combine the priuciples of a turbine water wheel and a wind mill. Herewith is illustrated the wheel, and also as it is to appear in operation on the Columbia river, where the inventor says it will furuish power to elevate 20,000 gallons of water per minute a height of 30 feet. It is built of steel throughout, works submerged in the current, is not affected by the rise and fall of water, and is controlled by an automatic governor.

The plan shown herewith is driven by the current motor, using a centrifugal pump. The rotary motion of the wheel is carried directly to the pump by means of wire-rope transmission. Other styles of connection can be adopted, and reciprocating or plunger pumps, connected by cranks and gears if advisable.



THE A. B. FRAME WATER WHEEL.



FRAME CURRENT MOTOR IN OPERATION.

Hydraulic Air-Compressor Scheme.

The Buffalo, N. Y., *Express* states that C. H. Taylor of that city has invented a hydraulic air-compressing system whereby power can be developed at much less cost than by turbines. The air is compressed by the direct action of falling water, without the aid of any moving machinery. The water is conveyed to a compressor by an open flume or through a pipe supplying a tank or stand-pipe around the headpiece of the compressor, where it can attain the same level as the water in the dam or source of supply. There are a number of small, horizontal air-pipes around the headpiece. These draw their supply of air through larger vertical pipes, which extend above the surface of the water and open to the atmosphere. As the water enters this down-flow pipe and passes the ends of small air-pipes, it draws in the air constantly, in the form of small uniform globules, which become entangled in the descending water, are carried down to an air chamber at the bottom of the pipe, compressing the air by weight of the water compressing the globules, according to their depth, below the tail-race water level, until they reach the point of separation. The air chamber at the bottom is sufficiently large to allow the air to rise to the surface of the water therein.

THE most voluminous patent ever awarded was sent out from the patent office iu October, '95. This patent was granted to James W. Paige, of Hartford, Conn., for a machine for distributing, setting and justifying type. It took 163 steets, containing 491 drawings, and 55 sheets of long primer to describe this patent.

Scientific Progress.

Acetylene Gas.

In San Francisco, as elsewhere, considerable commercial interest is manifested in the new acetylene gas. If half what is claimed for it proves so, it will work an industrial revolution. It was first heralded as destined to revolutionize the gas industry, but it is alleged that lighting is but one of the practical uses to which the product of carbide of calcium can be put. A New York concern—the Electro-Gas Co.—selling city rights at figures that would make a franchise for San Francisco worth about $250,000. This is for lighting, alone.

The Smithsonian Institution has paid its accidental discovers $10,000 as being the most important scientific discovery of the year, which it undoubtedly is. Heating a mixture of coal and lime, or charcoal and chalk, in an electric furnace and throwing the resulting compound into water evolves acetylene. One set of scientists claim that it is nothing more than an interesting laboratory experiment; others claim that it is of the utmost practical value.

It is claimed that "acetylene, ou being passed through an iron tube heated to dull redness, turns rapidly and completely into benzine. This is a product of prime importance, and is the base of thousands of organic substances. In illustration of the transmutations which can be effected, it may be pointed out that if the resultant benzine vapor be passed into strong nitric acid it is transformed into uitrobenzine, and this on treatment with hydrochloric acid and iron filings goes into aniline. With the formation of aniline the road is opened for the production of the immense series of dye substances of which aniline is the starting point. Instead of transforming acetylene into aniline, however, it may be changed into carbolic acid; thence it is but a step to picric acid, the foundation of the modern high explosives. Or it may be made into aniline, and then boiled with acetic acid, when it is transformed into anti-febrin, the well known fever specific. Again, by passing it through a tube heated to bright redness, naphthalene is produced, which is also the starting point for a legion of valuable chemicals. It would seem as though almost all the needs of man were able to be satisfied by this protean substance. The further investigation is pushed into its possibilities, the more astounding and bewildering they become. By the action of nascent hydrogen acetylene becomes ethylene, and this, on treatment with sulphuric acid and water, becomes alcohol, which, apart from its other uses, is absolutely necessary to the production of an enormous number of economic substances. In similar ways we can get such deadly poisons as oxalic acid and prussic acid, while acetylene is a cheap source of the aldehyde so much used in the production of artificial essences and the manufacture of mirrors. When, therefore, it is considered that from acetylene can be derived whole systems of dyes, medicines, essences, perfumes, poisons, explosives—not to mention cheap whisky—it will be seen that the latest product of the electric furnace has a utility out of all proportion greater than that which can be derived from its peculiar light-giving powers."

Going back to its utility as a light-producing power, photometrical tests have shown that for the production of a light of one normal candle power 0.6 litre of acetylene is required per hour if proper burners are used, while for the same lighting power 10 to 12 litres of coal gas used in ordinary burners are consumed. Acetylene, however, possesses different qualities, which are of a rather dangerous nature and have to be considered with caution. First, by its action upon copper or copper alloys a brownish substance is formed which is highly explosive; such metals, therefore, ought to be used neither inside the conduits nor for glow bodies, if acetylene, is employed as a lighting material. Iron is of neutral conduct towards acetyline. Second, a mixture.

of acetylene and air is explosive, the highest exploding power being reached in a mixture of one part of acetylene and 12 parts of air. Third, as all carbureted hydrogen gases, acetylene is very poisonous also. Happily, acetylene makes itself noticed quickly even in a very small quantity by its bad smell, whereby the dangers arising from leaks are restricted to a certain degree. Finally, it may be noted that acetylene can be formed during the storage and transport of calcium-carbide, also as soon as the latter comes into contact with water or absorbs hydrogen from the air. Sufficient measures of precaution are required, therefore, if acetyleue is to be adopted on an extensive scale.

Wastes of Heat in Generating Steam.

"Some Preventable Wastes of Heat in the Generatiou and Use of Steam," was the subject of a lecture recently delivered before the Franklin Institute, by William Kent, M. E., as reported in the *Journal of the Franklin Institute*. He stated that waste begins not unfrequently in the coal pile itself, or in its handling, its pulverizing or exposure to weather. In the furnace it is more largely wasted through bad styles of furnace or improper methods of firing. In the improper burning of coal a cause is found for a large amount of waste. In using anthracite the bed of coal may be too deep for the amount of draught obtainable, or too little draught for the amount of coal on the bed. In both cases there is imperfect combustion, obtaining from it only 4400 heat units per pound instead of 14,500. This is an easily preventable waste, this condition not obtaining to any extent if the relations of thickness of bed and of draught are such as to make the fire very hot and bright.

Another cause of waste is given as resulting from too much draught for the thickness of bed, or too thin a bed for the amount of draught. Thus imperfect combustion may be consequent either to a deficiency or an oversupply of air. In burning bituminous coal the escape of volatile combustible gases via the chimney robs the furnace of considerable heat. This is not easily preventable under present conditions of boiler practice, though it could be made so by proper appliances. It is necessary that the gas should be heated, also the air used to burn it, that combustion be carried on in intensely hot chambers and sufficient time be given for the gases and air to intermingle before escaping. A properly built oven with air-heating flues is stated by Mr. Kent as meeting these conditions.

Another cause of waste is located in the boiler. An insufficient extent of heating surface allows the gas, even if properly burned in the furnace, to pass into the chimney too hot. On the other hand, where a sufficient extent of heating surface is found, the surface may be so placed as not to be efficient; and the gases being short-circuited, may escape into the chimney without passing uniformly over the heating surface.

In the unclean condition of a boiler, inside or outside, or both, another cause for waste is found. Scale and soot are non-conductors of heat. Other wastes in the boiler are named, such as too small a grate surface, escape of steam through the safety valve, leaks of air in the setting of the boiler, and leaks of water into the furnace or flues.

The chimney also is often a sinner in the matter of waste. Much of this waste could be saved by the use of an economizer, or set of tubes placed in the chimney, through which the feed water is passed, and heated from the entering temperature to nearly or quite that of the boiler.

Another cause of waste is to be found in uncovered steam pipes. Sometimes these are too small and elbows too numerous. In the proper covering of pipes 90 per cent of waste is prevented.

In the steam engine itself wastes are numerous. In the following table we have the range of wastes, showing what may be expected to be the water consumed per horse-power per ton in different types of engines:

	Pounds and upwards.
Common direct-acting pump	100
Old style slow-speed throttling engine, non-condensing	45
Modern high-speed automatic cut-off	30
Compound " " "	22
Corliss single cylinder high-pressure	22
" " " condensing	18
" compound high	14
" triple-expansion condensing	12½

In concluding his lecture Mr. Kent says:

There does not seem to be any possibility of greatly reducing the waste in the steam engine; so that its consumption will be less than 12½ pounds per hour. In all steam engines we must throw away either hot steam, as in high-pressure engines, or a vast volume of hot water, as in non-condensing engines; and in the latter case there is no known way of recovering the heat from the water that we do throw away, so as to use it again in the engine. It may be left for the next century to discover some way of obtaining mechanical energy from coal without the intervention of the steam engine, but at present there seems to be no prospect of such an invention. The preventable wastes, however, are those enormous wastes which are indicated by the difference between a consumption of 12½ pounds per hour per horse-power, and the 25, 35, or even 100 pounds which are used in the various types of engines, and the still more inexcusable wastes which are indicated by the difference in the figures showing the best practice and the worst in steam boilers.

Myopes.

Dr. G. Sterling Ryerson, professor of ophthalmology in Trinity Medical College, Toronto, says:

Myopia being essentially a condition due to abuse of the eye, one is constantly obliged to say "don't" to patients. It occurs to me that it might be useful to put these prohibitory rules in aphoristic form:

1. Don't read in railway trains or in vehicles in motion.
2. Don't read lying down or in a constrained position.
3. Don't read by firelight, moonlight or twilight.
4. Don't read by a flickering gaslight or candlelight.
5. Don't read books printed on thin paper.
6. Don't read books which have no space between the lines.
7. Don't read for more than fifty minutes without stopping, whether the eyes are tired or not.
8. Don't hold the reading close to the eyes.
9. Don't study at night, but in the morning when you are fresh.
10. Don't select your own glasses at the outset.

It would almost seem as though some of these rules were too obvious to require mention; but practical experience shows that myopes abuse their eyes just in the ways stated. Reading by firelight or by moonlight are favorite sins. Reading lying down tends to increase the strain on the accommodation; and while traveling, tires the ciliary muscle because of the too frequent adjustment of focus. In short, anything which tends to increase the quantity of blood in the organ favors the increase of the defect, leading in extreme cases to detachment of the retina and blindness.—The Canada Lancet.

Power of the Brain.

The brain of mankind has been defined as a kind of phonographic cylinder, which retains impressions made upon it through the medium of the senses, particularly through the eyes and ears, says the *Family Doctor*. If this be true, memory must depend for its intensity and retentive qualities upon the degree of observation with which the record is made.

Nor is this all. If memory's record is kept in the shape of indentations upon the folds of brain matter, are they ever entirely effaced? In other words, do we ever really forget anything? May it not be that in the depths of the brain, memory has stored up a collection of things which are never again purposely turned to perhaps, but which instantly springs into being and flash through the mind whenever we hear or see something which recalls them?

There are several well-known mental phenomena which strengthen this theory. We know that memory often brightens during the last moments of life, and there are cases on record where Germans, French, Spaniards and others who, falling ill in this country years after having entirely forgotten their native languages, recovered and used them upon their deathbeds.

There is a theory that in all such cases the brain folds have relaxed, just as do the muscles and cords of the limbs and body, and that by so doing they expose to the mind's monitor indentations (recollections) which were long since folded up and put away as material that could not be of any particular use.

The balloon sent up in Berlin with self-registering instruments to investigate the atmosphere at high altitudes came down with the instruments in good condition in Bosnia. The balloon had reached an elevation of 53,872 feet (over ten miles). The thermometer had made desperate attempts to tell how cold it was ten miles above the earth, but failed. It did the best it could, but its limit was 52°. Another balloon is supposed to have reached an elevation of 72,000 feet (over thirteen and one-half miles) above the earth. Beyond recording these bald facts, the instruments seem to have given up their records in despair.

Don't Worry the Eyes.

The eye is a very sensitive organ, but it will stand a great deal, if you will not nag or overwork it. It is so much in evidence, and so constantly in use, that it is natural for people to be nervous if there is the least thing the matter with it, and to go to tinkering with it as if it were some piece of metal machinery instead of flesh and muscle.

If some little soreness appears, we are not satisfied until we have deluged it with "eye water." This as often brings on inflammation as it keeps it away; it may be that all the eye needs is a little rest.

A great many people use spectacles many years before there is any need of it. Instead of giving their eyes a rest, they keep them at work, with the aid and encouragement of glasses, sometimes ill fitted and really injurious.

"Everywhere" has in mind an old gentleman who at the age of sixty thought that his eyesight was failing, and wished very much to get some "glasses." But he lived at a distance from the place where good glasses were sold, and had to go without them, at least for several months. This necessitated a complete rest for the eyes, so far as reading was concerned; and they soon appreciated and took advantage of it. At the end of a few months he found, to his surprise, that his eyesight was becoming better again. Day by day it improved, and he finally found that it was as good as he had ever known it. He began to read again with new zest and vigor, being careful not to overdo the matter. He soon decided that he had no use for spectacles, and continued to the end of his life without them. He died over eighty years of age, with his eyes as "young" as ever.

So, when the eyes "give out," let us, if we are situated so that we possibly can, give them a chance to see what they can do for themselves, and maybe they will come out all the stronger and better for the chance.

EIGHTEEN MILES is the longest distance on record at which a man's voice has been heard. This occurred in the Grand Canyon of the Colorado, where one man shouted the name of Bob at one end, his voice being plainly heard at the other end, which is eighteen miles away.

OXIDE OF MANGANESE is reported discovered near Wallsbury, Wahsatch Co., Utah, similar in general appearance and value to the manganese mined in San Joaquin Co., this State, and worth from $20 to $35 per ton.

WITH so many highly-developed industries to choose from, the fact that such large attention is given to gold mining by both capital and labor is the best evidence of how the mining industry is considered as a business investment in these sunset years of the century.

DR. I. B. STORCH of Fruitvale sends an excellent specimen of pumice stone, croppings of a large deposit in Esmeralda Co., Nevada. Considerable has recently been written regarding a deposit of that material located near Salt Lake, Utah. It is found in Shasta and Sonoma counties and other parts of this State, and is of some commercial value, being used in the manufacture of soap, paint, burnishing metals, etc. T. B. Meyers of Sonoma says the supply there exceeds the local demand.

AN Alameda county correspondent asserts that the addition of a certain percentage of nitropbenole, or nitrobenzole, especially "nitropbenole sulphuret of soda," to the solution of cyanide potassium accelerates the extraction of gold and silver considerably. This important discovery was made at the chemical works of Mr. Schering, in Berlin, and experiments proved that two small gold foils, 1.5 grains each, were exposed for two hours to the action of the respective solutions; the cyanide solution, unmixed, absorbed only 2 per cent, while by addition of the nitrophenole sulphuret of soda 88 per cent of the gold was absorbed.

ON page 426 is a notice of the new gas acetylene. Considerable is claimed for it, but it is believed the most sanguine of these beliefs will never be realized. This belief is held in the old world as well as in the new. The *Journal fur Gasbeleuchtung* "has recently devoted a portion of two issues to an analysis of the cost of acetylene, by A. von Ibering, Aix-la-Chapelle. As to the cost of acetylene power, the conclusion is reached, basing calculations upon the price and quality of calcium carbide as furnished by the Neuhausen Company, that it would at least amount to 8½d per indicated horse power per hour. As gas engines ordinarily develop a like power from gas at 4s, say for ¾d, it is plain that there is no chance at present of competition from acetylene."

ONE noticeable phase of the cheap manufactures of Japan, now threatening the industrial life of this coast, is the additional leverage secured by disregard of ordinary business laws. In a piratical way the Japanese artisan pays no attention to the fact that a particular piece of mechanism is patented. He takes it apart and reproduces it without the slightest regard to the patentee's rights. Were an American artisan to attempt such a theft the law would speedily enjoin him, but in Japan the inventor is powerless. This is simply one feature of the kind of competition to which this country is subjected. It is not "a local issue." It affects alike the manufacturing interests of the entire nation. There is but one remedy, legislation embracing, in general, remonetization of silver and protection.

Electrical Progress.

Improvements in Engine and Dynamo Building.

Builders of automatic engines are themselves taking up the construction of dynamo electric machinery, claiming good results obtained for direct connected apparatus when engine and dynamo are built by the same company and assembled before leaving the works. The J. H. McEwen M'f'g Co., 26 Cortlandt St., New York, is one of the firms that have entered this field. They have made some recent improvements in the details of their engines, notably in the governor and cross head. Figure 2 is a cut of their governor, which is extremely simple, having but one bearing, and that a roller pin bearing, which requires no lubrication.

Figures 3 and 4 show the construction of their Cross Head. The shoes are held in position by eccentric bolts. Both upper and lower guides, as well as cross-head pin, are oiled from stationary sight-feed oil cup on top of frame. The oil is wiped off by upper shoe, and is caught in oil groove shown, extending across face of shoe, and led through oil holes at each end of grooves to inside of upper shoe, thence to a funnel-shaped oil hole in strap of cross-head box to cross-head pin; from there it drops to lower shoe and then through holes in this shoe to lower guide.

Their Thompson-Ryan dynamo represents a radical departure from the beaten tracks of dynamo design, differing in nearly every detail of construction from the ordinary type of machine. The most important feature is a set of series windings surrounding the armature, and termed balancing coils. This feature, which is the invention of Prof. Harris J. Ryan of Cornell University, was introduced for the purpose of balancing armature reaction.

At first thought it would seem that the addition of balancing coils to a dynamo would complicate the construction to a certain extent. The manufacturers claim that is fully offset by the simplification of the machine in other respects. The field castings of these machines are of steel and consist of but three pieces which are held together by four bolts. One of these castings is the "pole ring," shown in Fig. 5, through which the balancing coils are wound, and the other two constitute the field ring proper, Fig. 7.

The balancing coils are wound in such a way that the current passes through them across the pole face in the opposite direction from the currents in the armature conductors, and thus the magnetic effects of the armature currents are neutralized.

Fig. 6 is a view of the completed pole ring. The field ring, Fig. 7, shows on its internal periphery the "pole necks," around which the coils are placed. It will be seen that the field ring is of such a shape as to entirely enclose the field coils, thus thoroughly protecting them from mechanical injury. It will be noted also that the space in the field ring allowed for the field coils is unusually small. This arises from the fact that less than one-fourth as much energy is required to magnetize the fields of this dynamo as is necessary for a machine of equal capacity of ordinary design. On account of the very small amount of field energy required, the rise in temperature of the field coils is very slight, notwithstanding the fact that these coils are so nearly surrounded on all sides.

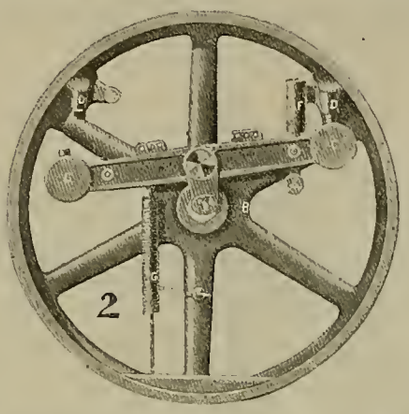
Fig. 8 gives a good idea of the appearance of the finished armature core.

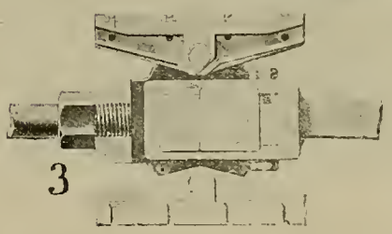
Fig. 9 is a view of the completed armature for a 200 K. W. direct connected railway generator.

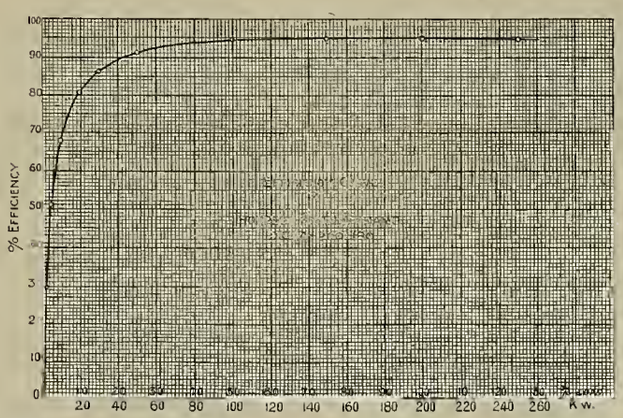
Fig. 10 is a view of complete brush-holder arrangement. The brush-holders project outward, and leave the entire outer end of the commutator free and accessible.

The only leads employed on the whole machine are one from the negative brush-holder ring to the negative terminal, and another from the positive brush-holder ring to the inner end of the balancing coils.

The whole brush-holder arrangement is adjustable around the commutator, and by loosening the clamp-bolts the brushes may be shifted backward and forward. This is only done, however, for the purpose of adjusting the compounding of the machine. By shifting the brushes in this way the machines may be adjusted through a range of from 10 per cent drop at full load to 10 per cent rise, and this without any effect whatever on the commutation.







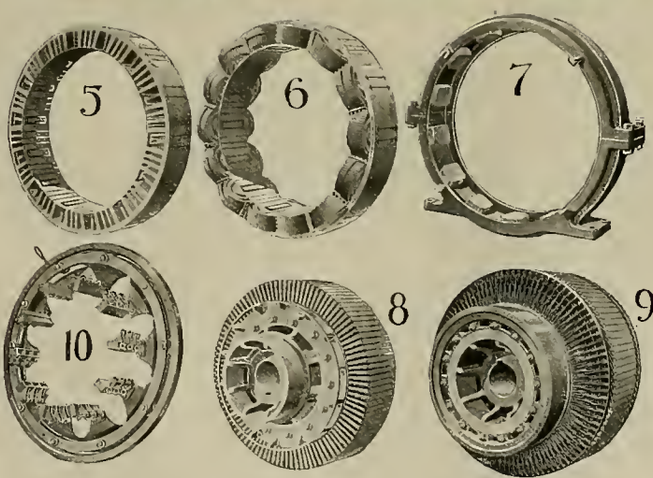


Fig. 11 shows a curve of commercial efficiency taken from actual tests of a Thompson-Ryan 200 K. W. railway generator. The peculiar features of this curve are not so much the good efficiency under heavy load as the unusually high efficiency under light loads, and the very great range of uniform efficiency. This is due to the unusually small fixed losses, the result of the very small field energy consumed and the light core losses.

Another important feature of this dynamo is the great ease with which two or more machines may be worked in parallel. The design of the machine peculiarly fits it for this sort of service. They may be thrown in parallel while differing widely in voltage produced, and each machine will take its due proportion of the load, notwithstanding the fact that they may be greatly over-compounded. Two or more of these machines will work perfectly in parallel, and divide the lightest load evenly or maintain perfect unison with the entire load thrown off.

Canal Electric Traction for Army Purposes.

A point of great importance as bearing on the wide extension of electric boat propulsion now in prospect in this country, resulting from the great success of the tests on the Erie canal, has arisen in France. For the last two years an electric canal-boat has been successfully operated on the Bourgogne canal, which unites the rivers Yonne and Saone. The electric motor on the boat receives current from an overhead trolley circuit. So satisfactory have been the results of this comparatively ancient system that the French Government has been asked to consider the facilities which would be afforded for mobilization and the transport of any supplies if some system of electric traction were provided on the canals leading to the frontiers. A leading French journal, after remarking on the superiority of water transit for the removal of the wounded, says that the canals leading to the eastern frontier of France would be able to take the heavy transport of five army corps, and considers the question of the general electrical equipment of the canals worthy of the attention of the military authorities.

Can the Voltage of Incandescent Lamps be Safely Raised.

Since incandescent electric lights first came into general use, it has been usual to employ therewith one particular voltage. The quantity of current, as measured in amperes, would vary, according to the number of burners to be kept alight; but whether these were few or many, the pressure at which the current was forced through the conducting wires and the delicate carbon filaments of the lamps was generally 110 volts. It was necessary that the dynamo, filaments, supply wires, safety fuses and other incidental features of the whole system should be adjusted with great precision to this voltage, which, compared with that of electric currents used for some other purposes, is very low, and, consequently comparatively safe.

Within a year electric lighting companies have been considering the advisability of employing a 200-volt or 220-volt current for incandescent service. The higher the voltage is, the more current a wire of a given size will carry. The copper of which such wires is made is a costly material, when used in large quantities, and for power transmission it has long been customary to effect economy by increasing the voltage. But ten years ago, when the great boom in electric lighting started, it was deemed expedient to use a low tension or low pressure current in the interests of safety. Now, however, so much higher voltages are used for other purposes that the civilized world is getting used to them, and the temptation to abandon the old standard for incandescent lighting, in order to increase the amount of service of existing lines, is natural.

If the only question involved in the proposed change related to the substitution of other dynamos for those now in use at the central station, there would be no reason for hesitancy. But there are several serious problems to be settled before a new policy is adopted. Some of these pertain to the manufacture of lamps suited to a current of higher voltage. While they are being made, the burners are subjected to tests in which 400 or 500 volts are required. Consequently the workman is exposed to greater peril. Greater care would be required, and this means a more expensive product. An enlargement of the pear-shaped globe might also be necessary, which would result in a loss of beauty if not another increase in cost. The consumers might not view such a change with favor, unless it were attended by a reduction in the charge for current, and nothing of that sort appears to be intended. A more serious matter is the possibility that the insulation of the wires in the houses, offices, and shops of consumers, while adequate to present needs, might develop defects that would lead to serious accidents were the voltage increased. The joints of a water pipe or steam pipe might stand a pressure of 100 pounds to the square inch without leaking or bursting, and yet succumb to a pressure of 200 pounds. Just so an electric current might stick to its conductor pretty faithfully at one potential, and overstep the barriers of insulation at

some weak point if that potential he doubled.

There are two other points considered: Much of the incandescent service is afforded by the three-wire system, under which two sets of lamps are operated, one with a 100-volt positive current and the other with a 100-volt negative current. Each has its own supply wire, but both use the same return wire. The arrangement really establishes a difference of poteutial equal to 200 volts hetween the supply wires. It is as if we had a pressure of 100 pounds in one water-pipe and a suction of 100 pounds in another beside it. The resultant strain between them would equal 200 pounds, although the strain hetween either one and a third pipe which was neutral would be only 100. Now, if the voltage for each of the two electric circuits of a three-wire plant he raised to 200, the potential hetween two of the wires of the line would be 400. Nor is there any certainty that matters would stop here. While electrical engineers talk about douhling the voltage, they are thinking of trehling it, and this means a strain of 600 volts, which is greater than that (500 or 550) hetween an ordinary trolley wire aud the return line afforded hy the earth. In all new wiring the increased risks cau be easily provided for; but misgiviugs ahout the condition of some of that already done are excited hy the recent agitation.

Electricity in Powder Mills.

"The appetite comes while eating," say the French, and that the same principle may he truly applied to the use of the electric motor is emphasized by certain experience which the General Electric Company has recently had with the Ætna Powder Company, of Ætna, Ind.

In November, 1894, this powder company decided to install two small slow speed generators for operating incandescent lamps on the Edison three-wire system. As these could not he delivered immediately, two second-hand machines were installed temporarily, and before the first two new ones ordered could be delivered, the order was changed to two larger moderate speed generators, with the privilege of changing them for two still larger ones. In June, 1895, the last two were ordered, together with two motors, one of one-horse power, the other of five-horse power. On August 2d, the Ætna Company ordered another motor of five-horse power and on August 14th, still another of the same capacity. The company having enlarged its plant during the summer found its electrical installation insufficient, and on October 12th ordered two forty-five Kilowatt moderate-speed generators, and two moderate-speed motors; one of twenty-horse power, the other of thirty-horse power. Thus, within one year electricity had given the powder company such satisfaction that it now has sixty-six-horse power in motors and uinety-three incandescent lamps taking current from the two forty-five Kilowatt generators. The one-horse power and the five-horse power motors are used to drive small mixing machines in the manufacture of dyuamite. The thirty-horse-power motor operates a large machine used for pulverizing nitrate of soda and the twenty-horse power runs a number of machines such as the dry pan and mixing machine. The powder company found that the first five-horse power motor, which they subsstituted for a steam engine, really performed a duty with which the engine found difficulty in doing.

The recent gradual increase in the use of electric power in powder mills is especially noteworthy. During the past year the General Electric Company has equipped several with electric motors.

THE longest telegraph line in the world ahove ground and without a hreak, has just heen completed in Australia. It runs from Rockhampton in Queensland, to Broome in Western Australia—a total length is over 6000 miles.

Practical Information.

Brazing.

In a late number of the *Machinist* a correspondent inquires regarding brazing. With your permission I will give him a few ideas of the art, says a writer. As he has only a charcoal fire his brazing must he on the top and hottom, or where the heat is applied, conscquently he must be on guard, or he will hurn his work hefore the brass melts. He can get brass grauulated from dealers in machinists' supplies. It comes in four sizes—coarsc, medium, fine and extra fine. Medium will cost forty cents per pound. If he does not do enough to make it an ohject he may take any sheet brass or hrass wire, and with a coarse file he can in a short time make enough to do a small job with.

Borax he can get at any drugstore, and hy pounding it fine and placing on a shovel in a moderate heat he can expel the moisture, when he can again grind it as fine as he choses; that is, provided he cannot get the pulverized. Before applying the brass solder he had better wet the article to be brazed, and theu dust the pulverized horax in liheral quantities over the joint to he made. With an iron he can transfer the borax along the seam, then when melted he can take his brass solder already mixed with pulverized horax, and distrihute along where the joint is to be closed, and when it is reduced to a flowing or molten state remove from the fire. After it is cooled he can clean hy immersiug the joh in a pickle of sulphuric acid and water, taking care not to have it strong euough to attack the iron and steel. The object of the borax is to prevent scaling of the iron and oxidization of the brass solder, which latter will otherwise he burned up, and no good done. I have never had any difficulty in doing this class of work, in fact, had rather do it than attempt to mend a rusty wash-hoiler with tinners' solder.

He must remember that in all cases the article to he hrazed must have greater heat-resisting power than the solder or the article will melt first. Brass solder is only copper and spelter, same as low brass, and is used by those doing large quantities of work on account of its convenience. The pickle attacks the melted borax, and cleans the work ready for the file. Otherwise the file will soon go to the bowwows.

Metalloids.

Chemically pure iron is of no value to the manufacturer, for, strange as it may seem, it is the impurities in iron which make it the most valuable and important of metals. These impurities are metalloids. The metalloids which are particularly interesting to the foundryman are carbon, silicon, manganese, sulphur and phosphorus. A good foundry pig iron for general purposes should contain from 3.25 to 3.5 per cent of carhon, from 3 to 3.25 per cent of silicon, from 5 to 75 per cent of manganese; the phosphorus may run as high as one per cent, hut sulphur should never exceed .05 per cent. The hlast furnace that supplies the pig iron to the foundryman is supposed to analyize its iron, and the foundryman, if he is conducting his business according to modern practices, orders iron with reference to carhon, silicon and manganese, according to the nature of the metal he desires to put into his casting. The market price of pig iron generally depends on the percentage of silicon it contains.

BRITISH STEAMERS are loading cargoes of iron at Mediterranean ports for Philadelphia. The shipments aggregate 100,000 tons of ore. Contracts have heen made for that amount of the raw material for use in Pennsylvania furuaces. The cargoes come from Seriphos, Benisaf, Elha, Bona, Carthagena and other ports in Spain, Greece and Italy. Freights are ten shillings per ton from Seriphos and nine shillings from the other ports. They are mostly steamers run on monthly time charters.

The new mines of the Spanish-American Company, which were recently started, have vessels now regularly engaged in the trade. The leading point is at Dalguiri, fifteen miles to the eastward of Santiago de Cuba. The Juragua Company, which was the first to ship ore from Cuba, has a regular line of steamers which load ore in Santiago bay and take outward cargoes of coal to other West Indian ports.

THE Treasury Department has at last announced that the World's Columbian Exposition medals and diplomas would he ready for delivery by the exposition commission some time in February next. and, acting under authority of the last sundry civil bill, persons receiving medals are entitled to electrotypes of the same on payment of the cost.

Railroad Statistics.

An epitome of the seventh annual report on the statistics of railroads in the United States for the year ending June 30, 1894, is furnished. The report, which is the work of Henry C. Adams, statistician of the Interstate Commerce Commission, is of unusual interest. It shows that on June 30, 1894, there were 178,708.55 miles of road in the United States—an increase over the previous year of 2147.48 miles—the per cent of increase heing smaller than during any year covered by the existence of the Interstate Commerce Commission. There is little to warrant the hope that the increase in mileage for the year ending June 30, 1895, will exceed the figures of the previous year. Of the entire mileage, 40,818 were iu the hands of receivers.

Illinois leads the country in the length of its lines. In that State the total mileage is 10,460.58. Pennsylvania follows with 9594.39 miles and Texas is a close third, having 9264.34 miles of tracks. Tennessee has 3064.59; Mississippi, 2478.16. Louisiana's mileage is the shortest of any Southern State, heing 2050.51. Rhode Island, heing the smallest State, has also the smallest trackage—226.06 miles.

The column showing the number of miles of tracks to 100 square miles of territory gives some peculiar results. New Jersey has 28.91 miles to every 100 square miles. New York has 16.95, Illinois 18 68 and Texas only 3.53. Nevada has only 0.84 miles to the 100; Tennessee has 7.34, Mississippi 5.35 aud Arkansas 4.65.

The number of miles to 10,000 inhabitants is calculated, and the results are equally as interesting. Montana has 191.73 to this number, Massachusetts has 8.77, Illinois 25.32, Texas 38.38, Tennessee 10.06, Arkansas 20.25, Mississippi 17.80. Rhode Island has only 6.06 miles for every 10,000 people in the State.

The number of locomotives on June 30, 1894, was 35,492, being an increase of 704 over the previous year. The total number of cars in use on June 30, same year, was 1,278,078. This does not include cars of companies or private individuals furnishing railways with equipment. The increase over 1893 was 4132. This is a falling off in the ratio of previous years, but it is to he remembered that larger cars are heing made and therefore capahle of greater tonnage.

The section devoted to the employes of railroads shows that the number of men in the service for the year ending June 30, 1894, is less than for any other year as far hack and including 1891. On June 30, 1894, 779,608 persons were in the service of railroads; in 1893 there were 873,602; the previous year, 821,415, and in 1891 there were 784,285 persons in railroad service. In 1894 there were 5257 general officers—a reduction of 1400 from the previous year.

Thus it will he seen that hard times, like death, slighted no class. The biggest proportionate reduction was in this class. In 1893 there were four general officers to the 100 miles, while last year there were only three. Office clerks were reduced from 27,584 in 1893 to 24,779 in 1894. Station agents in 1894 numhered 28,199, but this class was increased 180 over the previous year. Other statiou men in 1894 were 71,150—a reduction of 4000. Engineers in 1894 were 35,466; in 1893 they were 38,781. Firemen were reduced from 43,590 to 36,327 in 1894. In 1894 there were 24,823 conductors—a reduction of 3000 in round numhers; other trainmen, 63,417—a reduction of about 10,000. The following shows the number of men in various other departments, the first figures heing for 1894, the second for 1893: Machinists, 29,245–30,869; carpenters. 36,328 41,878; other shopmen, 84,359–93.709; section foremen. 29,660–29,699; other trackmen. 150,711–180,154; switchmen, flagmen and watchmen, 43,219–46,048; operators and dispatchers, 22,145–22.619; employes floating equipment, 7469–6146; all other employes, 85,276–105,166; unclassified, 284 for 1894. The total for 1894 is 779,608; for 1893 it was 873,602; total reduction, 93,994. What hecame of this number of persons thrown out of work by the hard times? The greatest aggregate decrease was in the States of Ohio, Indiana, Michigan, Illinois, Wiscousin, Iowa and Minnesota.

There was in most cases a reduction of salaries in 1894. The following table shows the average daily compensation for the three years:

	1894.	1893.	1892.
General officers	9.71	7.84	7.62
Other officers	5.75	.....	.....
General office clerks	2.34	2.23	2.20
Station agents	1.75	1.65	1.68
Engineers	3.61	3.66	3.68
Firemen	2.03	2.04	2.07
Conductors	3.04	3.08	3.07
Other trainmen	1.89	1.91	1.89
Machinists	2.21	2.33	2.20
Carpenters	2.02	2.11	2.08
Other shopmen	1.69	1.74	1.71
Section foremen	1.71	1.75	1.76
Other trackmen	1.18	1.22	1.22
Switchmen, flagmen and switchmen	1.75	1.80	1.78
Telegraph operators and dispatchers	1.93	1.97	1.93
Employees—account floating equipment	1.97	1.96	2.07
All other employees, laborers	1.65	1.70	1.67
Unclassified	.....	1.64	1.57

Referring to the averages for the entire year, it appears that the only class of employees which received compensations in excess of $3 per day are enginemen and conductors. General office clerks, firemen, machinists and carpenters received hetween $2 and $3 per day; all other employees were in receipt of a compensation less than $2 per day. In the case of employees assigned to the operation of floating equipment the averages presented in the ahove table are somewhat misleading, inasmuch as there is no attempt at classification hetween skilled and unskilled labor.

It may be an occasion of surprise that the commercial depression of the year 1894 did not cause a more marked decrease in the average compensation of employees. This is douhtless explained by the decrease in the number of men employed. The saving in the payroll was achieved hy the reduction in wages. So far as the movement for the three years covered hy the compilation is concerned, it appears that in most cases the average rate of compensation was higher in 1893 than in 1892, and, although the year 1894 shows a decrease, it still remains higher in some groups, for quite a number of classes, than in 1892.

The total railway capital ou June 30, 1894, was $10,796,813,000. The amouut of capital to each mile of line was $62,951. In 1893 it was $63,421. The funded debt per mile was $31,233. The aggregate of stock was $4,834,075,659. The amount of stock per mile is $28,186.

For 1894 there were 540,688,199 passengers carried, and 638,186,553 tons of freight hauled. The total earnings for 1894 were $1,216,178,602. This is a decrease of $154,222,887 from the previous year, or 11.25 per cent.

The chapter on the numher of persons killed conveys some peculiar information. The total of passengers, employees and others killed in 1894 was 6447; injured, 31,889. These figures are lower than for three previous years. There was one trainman killed to every 156 in the service, and one out of twelve was injured. The numher of passengers carried for one killed last year was 1,668,781. Last year 251 persons were killed in coupliug aud 7240 were injured.

Mining Summary.

CALIFORNIA.

Amador.

THE PIONEER, PLYMOUTH DISTRICT.—*Ledger:* The Pioneer mine at Plymoutb, owned by Dr. Tbos. Boyson, has been sold to the Pioneer Gold Mining Co., which numbers among its subscribers some of the most prominent stockholders of the Kennedy Company. Tbe French syndicate on the 30th ult. wired the doctor, offering to pay an installment of the purchase price and the remainder in thirty days, but Dr. Boyson refused to alter the terms of his agreement with them and immediately organized tbe new company under the auspices of Messrs. Barton, Curry, Goodwin and Reichling.

ENOCH, PINE GROVE.—E. A. Trask, owner of tbe Enoch mine at Pine Grove, has just had a crushing of fifty tons of ore from bis mine made at the Reward mill, from the proceeds of which he shipped a little less than $1000 in free gold. He bas purchased a three-horse power gasoline engine to use in his tunnel for hoisting and pumping.

NORTH GOVER, DRYTOWN. — An agreement has been prepared by tbe owners of the Nortb Gover and Mr. Purington to transfer tbat property for $25,000, to be paid witbin a year, and sent to Col. Isaac Trumbo for bis inspection and signature. This property joins the Gover, on which Col. Trumbo is now operating, and can be worked from the latter property very economically.

UNION CONSOLIDATED, CLINTON DISTRICT.—The Union Consolidated Gold Mining Company has been incorporated to operate tbe Clinton Consolidated mining properties. Work is now in progress. Enough square timbers are on the ground to sink 300 feet, and sinking will be commenced by the new company as soon as the hoisting plant is moved to more solid ground, and otberwise put in good order.

THE ONEIDA, JACKSON DISTRICT.—The old incorporation, the Oneida Mining Company, bas taken on new life. Tbey have filed in the Clerk's office a certificate of the increase of stock of the company to $3,200,000.

Butte.

At Forbestown tbe Denver mill has begun crushing quartz. Twelve men are employed in the mill and mine.

The Bullion is running and a full crew of men is busy at tbe Goldbank.

Calaveras.

THE FELLOWCRAFT MINE. — *Citizen:* The new hoist at tbe Fellowcraft mine is in operation. The water force is about twice as strong as is needed. The pipe taps the Treat ditch about 1700 feet from the top of the bill. and has a good fall all the way. At this point it is run into a reservoir wbere another pipe conveys it 200 yards farther down a very steep hill to the wheel.

CHRISTIAN GULCH PLACERS.—Great activity is reported in placer mining at Christian Gulcb. Four placer claims are being actively worked and all are paying well. About a month ago one of the miners took out a nugget weighing $247. Forty and fifty dollar nuggets are quite common, wbile smaller sizes are never commented on. Tbe gold is of the coarse channel variety.

El Dorado.

AROUND PLACERVILLE—(Special Correspondence).—Propositions have been submitted by Eastern people for the purchase of the Salisbury mine.

Stephens & Carmody have bonded the Mammoth and Boulder properties from Jergens & Blair, in the southern part of the county, and erected a ten-stamp mill. They have an eight-foot ledge at forty-feet, which averages $10 per ton.

The Georgetown divide is coming to the front with its gravel and quartz mines, now in course of development, and will make a good showing.

The Church mine will add thirty stamps to its plant, making forty in all. Work has already begun on tbe improvement. A new vein has been discovered, running from the surface to the 1200 level.

The Grand Victory has opened another new ledge of very high grade ore.

The following is a careful and conservative estimate of moneys expended in El Dorado county during the past eleven months in the development of mines, the erection of plants, and their operation:

For machinery and improvements	$610,500
For water	35,000
For fuel	30,500
For labor in mills and mines	450,000
Repairs and supplies	50,000
Sawmill output (for mines and mills)	25,000
Total	$1,201,000

Tbis does not include the purchase price of properties.

The Rose Kimberly, twelve miles soutb of Placerville, in the Jay Hawk district, owned by San Francisco people and capitalized at $1,000,000, is about to be operated on an extensive scale. Tbe shaft, at present 200 feet deep, will be sunk 300 feet deeper. The vein is five feet wide, and the ore assays $15 per ton. Tbe capacity of the present mill, used for prospecting, will at once be increased. Negotiations are now ou for the erection of a compressed airplant.

Mono.

At Lundy there are 40 men working in the Jackson and Lakeview mines and about ten in the mill. Besides the stamps and chlorination plant there are five concentrators.

At the Copper Mountain they are raising from the lower to tbe upper tunnel—700 feet. A hlower is being put in.

The Hydraulic, near Copper mountain, is looking well. In former days R. N. Graves sunk nearly $70,000 on tbis property. It has been idle for tbree years but now Mr. Graves has encountered high grade, coarse gold, and is juhilant over the prospect. He has taken up reservoir rights and will build dams in the spring.

Work is suspended at Mammoth until spring. The mill is nearly completed, but as the material is exhausted Mr. Hammond concluded not to order any more until the snow season is past.

AROUND BODIE.—Tbe Standard and Syndicate cyanide works and Syndicate mill and mine have closed down for the winter.

The Bodie Tunnel mill is running steadily on custom ore, most of which was taken from the Bodie Tunnel mine by the different lessees.

The Southend cyanide is making its last clean-up, and will close till spring.

Bodie shipped more bullion during November tban for any other one montb in over a year.

Fresno.

COPPER KING.—The Los Angeles Petroleum, Smelting and Mining Co. have bought tbe Copper King mine, 30 miles east of Fresno, and will build smelting works. There is a 6-ft. body of ore, mining 10% in copper, $10 in gold.

Nevada.

Tidings: The outlook at the Lamarque mine is now so encouraging that fifteen additional miners are to be put on. They will run drifts on the 300-foot level, and the rock will be sent to some adjacent mill to be worked.

Transcript: The Republic, National and Culbertson mines are all on tbe same lode, which runs north and south, with an east dip at an angle of sixty degrees. The casings are greenstone and porphyry, the greenstone lying on the foot. Tbe ore veins are from three to ten feet on this lode, which is about two miles long. On the National mine the shaft is down 180 feet. Tbere is a fine ore body, and the five-stamp mill is kept running night and day. The ore is well milled and averages about $7 per ton. There is enough quartz in sight to keep a twenty-stamp mill running.

In the Culbertson mine, which adjoins the National on tbe nortb, the shaft has been sunk to a depth of 160 feet, and levels run north and south, all in ore, yielding about $8 a ton. Tbere is a new ten-stamp mill tbat is kept running day and night.

AT WASHINGTON.—*Herald:* At the Oak Tree mine, ten stamps are now running on fair-grade ore.

At the German tbe main tunnel is being extended, and a raise for air between the main tunnel and the old works above is partially completed.

Supt. Johnson reports everything at tbe Spanish going satisfactorily, though tbe depth of snow is something of a drawback to them.

At the Gaston Ridge, Supt. Harmon thinks, at the expiration of ten months' time, be will have tbe entire 1800 feet of lower tunnel completed.

At tbe Mountain View mine the workers are extracting milling ore.

The Derbec Mining Co. has bonded tbe Bishop mines at Bangor.

Work has been resumed on the Rocky Bar mine at Washington.

Placer.

STRUCK RICH GRAVEL.—*Herald:* Tbe North Fork Co., who are running for gravel near Forest City, struck tbeir channel recently, and it was so good tbat half the town went up to take a look at it. Superintendent Jones and the company are more tban pleased with their prospects now, as tbe gravel is rich enough to make every carload pay well.

"Nine carloads that were washed a few days ago yielded $26.85," says Mr. Page, wbo is the chief promoter of tbe enterprise, "and even then we could not clean the bedrock, as we were working in water." As the North Fork is a tunnel proposition, it will be seen that this is good pay. Mr. Page thinks that they will be able to extract and wash gravel for about 65 cents per carload.

The gravel bed is 4½ feet thick where they are working now, and they have run into it 29 feet. Tbe company has over 11,000 feet of this channel.

Plumas.

A shipment has been made of 3400 lbs. concentrates from the Shenandoah mine for reduction, representing 24 tons roasted ore.

Riverside.

MORE GOLD FOUND.—A topic of local importance is the new discovery at the Leon mine, six miles southwest of Winchester. S. R. Porter, president of the company, reports that tbe owners are highly elated over the prospect. Stock in the mine has advanced from 50 cents to $1 a share.

San Diego.

AT JULIAN.—*Sentinel:* Tbe Venturina Mining Company has men at work fixing up the mouths of the two tunnels which they propose to run into the hill to tap the ledge. The upper tunnel will he 400 feet long and the lower 550 feet. They will cut the vein 200 and 350 feet below the surface. Tbe Fraction mine has been recently purchased by the company and lies above the Cahle. The tunnels being run for the development of the latter will cut the ledge of the Fraction farther on in the hill, so that both mines will be worked together. The ledge of the Cable mine is about a foot wide and several good crushings of ore, averaging about $25 a ton, have been taken out. When preliminary work has been done, it is proposed to put on a larger force of men.

A force of eleven men is at work on the preliminary operations at the Owens mine and the shaft has been retimbered down to the water line, 175 feet from the surface. The large building which covers the hoist and the machinery connected with it, is nearly completed and work can now be carried on uninterruptedly, regardless of weather conditions. The pumps will be set to work in a few days, and it is expected that in the course of a month or so ore will he taken out. The mill and other appliances have been put in good order.

Shasta.

SALE OF GRAVEL CLAIMS.—*Free Press:* Dr. O. H. Simonds and Isaac Baer, Colorado capitalists, have completed the purcbase of the Doeblin, Berkenfield and Reed placer claims, located about a mile and a half above old Horsetown, on Clear creek.

Tbese claims embrace 300 acres of rich gravel, and tbe purchasers, before they can successfully work the property, will bave to build a pipe line about six miles to utilize tbe waters of Brandy and Boulder creeks, which will cost about $18,000.

Tbe Ancient Channel Drift Mining Company have 200 feet of their tunnel completed, and are now upraising to strike the pay gravel in their mine on Dog creek.

The railroad from Keswick to tbe Iron Mountain mine is expected to be completed next week. The smelter is being erected and active operations will shortly begin.

Sierra.

THE PRIMROSE.—W. McNaughton has four men on the Primrose, running a tunnel 300 feet, near tbe old millsite, north.

Siskiyou.

MINING NOTES.—*Journal:* The cold weatber of the past few days has stopped the flow of water in the small streams and ditches, by freezing, but a change may be anticipated shortly, as the freezing spells seldom last more than a few days at a time. Tbe cold weather will be all tbe better for mining in the end, as it will keep tbe snow on tbe mountains from melting too rapidly and causing dangerous and damaging floods.

The underground mining in drift and quartz claims continues right along, regardless of weather, in getting out rich pay gravel and quartz. The gravel taken out can be washed in tbe sluices when a good head of water is available, and tbe quartz can be crushed in the steam and water power mills when most convenient.

There is already sufficient snow on tbe mountains to prove a good fountain in supplying water, with our season of heaviest snow and rain storms still to come later, especially about New Year's and during January and February.

The American Mines Association of Chicago, with C. E. Gates as president and H. C. Latshaw, vice-president, M. L. Williams, secretary and treasurer, together with tbe old Gold Ball Mining Co., has erected a twenty-stamp mill at the Gold Ball mine, on Salmon river, under the superintendency of E. Durham, a mining man sent out by the American Mines Association.' They have also erected six tanks for working ore under the cyanide process. Tbese tanks were erected by R. D. George. This is one of the best properties on Salmon river, and these extensive developments will enable its owners to work the mines to tbe greatest advantage.

The pumps at the Espey Hunter mine on Sbasta river have not started up yet. It has been quite an undertaking to repair tbis heavy machinery.

The arrastra of Scbeld & Steele on Long gulch bas been completed, and they are now busy taking out rock. This rock pays exceedingly well, some of the ore going $100 to the ton.

Tbe Blue Gravel mine is now clear of water and the force is busy putting in new tracks and switches. It is expected tbis work will be completed in another week, and tbey will then commence taking out pay dirt.

Tuolumne.

THE BELLEVIEW MINE.—*Banner:* The mine under the management of A. N. McDonald is a dividend paying property. The Belleview does not depend on water supply to keep it in operation. The mill is run by steam power.

Trinity.

TUNNEL FINISHED.—*Journal:* Smith & Ringwood have finished their contract with the Lagrange Company for running a tunnel on West Weaver. They began September 17th and finished December 5th. It is 462½ feet long, 6 feet high and 5½ feet wide.

Yuba.

Messrs. Mowatt and Chapin, representing the S. F. Quartz Mining Co., are developing the company's property near Timhuctoo.

NEVADA.

LINCOLN COUNTY.

INCREASING THE CAPACITY.—The DeLamar Company has douhled its crushing capacity at the mill, says the Pioche *Record.* A new crusher of largest size was started up a few nights ago. Two new boilers of 250-horse power are heing put in plaee alongside of the two old ones. The next step will be the addition of extra pulverizers and leaching tanks to bring the works up to the promised 150 tons a day working capacity.

OREGON.

BAKER COUNTY.

Ira S. Schenck of Minnesota, has hought the Ohio mine, an adjoining property to the Columbia, in the Cracker Creek district, representing citizens of Minnesota. The officers are: President, B. H. Hinkly, Secretary, L. M. Manchester. The mill will he erected in the spring.

SOUTHERN OREGON.—Gold Hill *Miner:* The Daisy mine is again in a fair way to pay a good dividend.

There are now dozens of men with pick, shovel and rocker working along Rogue river. Many of those men have tents stretched, and one can see their camp fires hurning while they are engaged in their work along the water's edge. There is no limit to tbe amount of paying ground up and down the river and the day is not far distant when the ground will be worked on a larger scale. Some parties bave already been experimenting with water wheels for throwing water in quantities sufficient for placer work. What is needed is a great canal, furnisbing water sufficient for all.

The Lance Mining Company, which bas purcbased 700 acres of George W. Lance, at tbe outlet of Footes creek, is rushing work in putting the mine in working order. Tbey are cutting a raceway 2000 feet long and twelve feet wide, to reach Rogue river with the tailing. They bave let the contract for 600 black and 30,000 feet of lumber for flume. They bave also let the contract to build a reservoir covering six acres, and for ditches about six miles for sluicing and piping purposes. Tbey bave placed an order for 2000 feet of fifteen-inch pipe, expecting to be piping in February.

Twenty-five men have steady employment in and about the mine at Riverdale, twenty miles south of La Grande. The mill is running steadily night and day and will continue in operation until it freezes up. Tbe mine this winter will be tapped at a greater depth, and other prospects in the district developed.

AT GRAND RONDE.—Superintendent Morcum, of tbe Grand Ronde Placer Mining Company has cleaned out a ditch six feet across the top and four feet in depth for a distance of six miles, it is readiness for spring work. 1200 feet of pipe bas been laid and five giants are at Hilgard to be taken to tbe mines.

BRITISH COLUMBIA.

CHARACTER OF ORE CHANGING.—As greater deptb is attained in the mines about Rossland tbe character of tbe ore, as usual in all mining camps, is changing. Sulpbide ore mixed with quartz is one of the characteristics of the new shaft in the Le Roi. Ore of tbe same character bas been found in the War Eagle, Center Star and Josie.

ALASKA.

Record: Tbe Treadwell is pounding out its million per annum; the Mexican follows with a full quarter of that sum; four little stamps at the Bald Eagle put out $700 every twenty-four hours during tbe season; tbe several mills in Silver Bow Basin grind away upon ore which yields its yearly balf million; Sbeep Creek adds no small sum to tbe output; hundred-weight shipments of bullion are by no means infrequent from tbe Berner's Bay mines; the forty stamps at Unga contribute sums of heavy proportions; Golovin Bay sends to California smelters shiploads of silver ore rich enough to pay bandsome profits even at the present depreciated price of the white metal; tbe Yukon will show up no less than a round balf million for the past season; the placers in Silver Bow Basin, at Lituya Bay, at Cook's Inlet and in every nook and corner of the territory, add tbeir hundreds and thousands to the annual output, to say nothing of the hundreds of claims awaiting only development to become paying properties.

IDAHO.

SHOSHONE COUNTY.

(Special correspondence).—Pierce City has another stamp mill pounding away on free milling gold ore from tbe Idaho mine which is now under a fair way to develop into a large gold producer. Tbe ore body is not so large in the tunnel as it was in the sbaft, but the ore is far richer, free gold being visible in quite a few places in the vein. The formation in the Idaho is granite; trend of tbe vein is from the northeast to the southwest, similar in that respect to most of tbe other known veins in tbis camp. The Bond mine, owned by Dunn Bros., is now working three shifts in the mine, and is giving employment to about 18 men. They are producing lots of gold; the cleanup last month for three weeks' running time being 190 ounces of gold, and the ore averaging close to $90 a ton. Another discovery has been made near the Bond mine by C. Henley and J. Morrow. Mr. Morrow sold out his interest to parties from Moscow for $800. The vein is very small, hut high-grade, showing free gold. A mill test of a few tons at the Dunn mill turned out very satisfactorily to the owners. There are three men at present at work on this property, and the owners intend putting a mill on next spring, if the ore shows up as good with a little more development. The formation in this camp is principally granite, with dyke porphyry cutting the formation is all directions. There are also reefs of hard granite cutting the formation from the east to the west; also reefs of syenite in various parts of the camp. The placer gold found in tbe various gulcbs of this camp is different in every gulcb, which, together with tbe local wash or gravel, indicate that the gold is local.

Statesman: The Hidden Treasure Mining Company in Neal distriet has let a contract to run a 500-foot tunnel to open the vein at greater depth. Tbis is to he a crosscut and it will develop the property 150 feet vertieally below the present workings, or 300 feet below the outcrop of the vein.

GOLD AND TIN.—John Donaldson, Prairie Basin, Lemhi county, managing the Prairie Basin placer mines, has constructed a ditch a mile long, and a flume 1000 feet in length. Hydraulies will be used and a 115-foot pressure has heen ohtained. This placer comprises 1000 aeres of gravel. A reported feature of these gravel beds is the presence of stream tin. In places the yield in tin is 70 per cent.

THE CŒUR D'ALENES.—*News:* At the Standard mine on Canyon creek there are eighty men employed, all told. The Campbell tunnel is in 800 feet. This will require a total length of 2587 feet to cut the lode, which it will intersect at 436 feet in vertical depth below the Banner tunnel. Next week the Standard mill will close down for about six weeks to

permit of improvements. This will stop the stoping in the mine for that period.

At the Gem sinking is the only work in progress. They have just made a record of eighty-five feet in thirty days. The shaft now lacks sixty feet of the third level, when a station will be blasted out and a full crew of about 130 men put on. This will probably occur some time in February. The property now employs thirty-five men, all told.

The Hunter mine at Mullan started up a week ago, but the cold weather of Sunday froze them up again. On Monday the mine was closed for the winter. Nearly all of the men have gone into winter quarters, with the expectation of starting up again some time in February.

At Wardner the mines are running along without friction or incident of any kind, except the monthly pay days. The Last Chance paid out $10,000 to its employes yesterday.

The owners of the Wyoming are doing some development work this winter. They have a tunnel 100 feet long and several crosscuts and raises, all in ore.

The Morning is working about ninety men, and is running from 220 to 240 tons of ore through one side of the concentrator daily.

MONTANA.

PRODUCTION FOR 1895. — Following is the Butte *Miner's* estimated production of Butte in copper and silver for 1895, using the product for the first eleven months as the basis.

Anaconda Company:	
Copper, 110,000,000 lbs at 11c	$12,100,000
Silver, 3,150,000 oz. at 66c	2,079,000
Boston & Montana:	
Copper, 40,000,000 lbs at 11c	$4,400,000
Silver, 1,200,000 oz. at 66c	792,000
Butte Reduction Company:	
Copper 5,000,000 lbs at 11c	$550,000
Silver, 400,000 oz. at 66c	264,000
Gold, 1,500 oz. at $20	30,000
Butte & Boston:	
Copper, 23,000,000 lbs at 11c	$2,530,000
Silver, 345,000 oz. at 66c	227,700
Montana Ore Purchasing Company:	
Copper, 16,000,000 lbs at 11c	$1,760,000
Silver, 640,000 oz. at 66c	422,400
Parrot Copper and Silver Company:	
Copper, 12,000,000 lbs at 11c	$1,320,000
Silver, 2,200,000 oz. at 66c	1,452,400
Gold, 5,000 oz. at $20	100,000
Colorado Company:	
Copper, 6,000,000 lbs at 11c	$660,000
Silver 75,000 oz. at 66c	495,000
Gold, 4,500 oz. at $20	90,000
Butte Sampling works:	
Gold, silver and copper (etc.)	$500,000
Total output for 1895	$29,772,500

THE LIVERPOOL.—Lump Gulch *Miner:* This stand-by property of Lump gulch has been partially closed down during the past week, the proprietors having come to the decision, last Monday morning, to do no more dead work in the mine until some time in the future—possibly next spring—and in consequence twenty-two men were laid off, leaving only a force of twenty-one men employed on the property. This force will be kept steadily at work stoping out ore now in sight, and working out the levels down to the 400. It is to be regretted that the proprietors of this property should have come to this decision just at the beginning of winter, and they probably have reasons for it of which we are ignorant. At the present price of silver there is not much to encourage the mining man to open new ground by sinking to greater depth in property already opened, or by trying to find new mines and exploit them. In the case of the Liverpool, as well as in all the other mines shipping ore from this gulch, and in this entire mineral district for that matter, there would be nothing doing at all, were it not for the exceeding richness of the product.

THE KATIE MINE AT BASIN.—James Glass, manager at the Katie mine, has disposed of a one-third interest in the property to Springfield, Mass., capitalists, who will build a 500-ton mill and probably a smelter.

There is a report that there is a deal under way by which the Hope at Basin may soon change owners. Prof. Park, the expert, who recently examined the mine, has gone to New York City, to report to the capitalists who have in view the purchase of the property.

A GOOD SHOWING.—Montana listed mines paid in dividends during the month of November the sum of $800,000. Up to and including November of this year, the listed mines of the State—ten in number—have paid the sum of $1,654,140. This does not include the Anaconda, which paid more than all the others put together. It is estimated that the mineral output of Butte this year will be $31,000,000.

UTAH.

MERCUR ARSENIC.—*Tribune:* The arsenical ores of Mercur and of Sunshine, toward which so much antipathy has developed by reason of their repugnance to the cyanide process, now promise foundation for another branch of the mining industry as important, perhaps, as any within it; and the time is not distant when an arsenical product must figure in the output of Camp Floyd mining district.

There is not a mine in Mercur or at Sunshine in which the presence of this mineral upon one level or another is not revealed. While their occurrence in some are greater than in others, the fact of their presence is none the less positive.

A grave question with some has been as to how to extract the values from the ore in which the arsenical property occurs, the average miner, however, attaching no value to the arsenic. It has long been known that the roasting of the ores in which the repugnant property appeared would expel it, but the expense of roasting, it was pleaded, was greater than in the auriferous property of the ore with which it was associated. Hence it is that the arsenical ores have been shunned and large bodies allowed to lie idle while the search went on for the oxidized bodies.

In the laboratories at the various mines the struggle has been to overcome the arsenical objection. On an experimental scale it is now ascertained that not only can that be accomplished, but that the arsenical product, which possesses commercial values far above the average mineral, can be made to pay the expense of extracting the gold and yield a handsome profit to the owner.

The means for doing this goes back to the roaster, the only addition being the chambers, into which the arsenical fumes are passed and in which the product is condensed, subsequently refined and made a commercial product to serve the arts and sciences. Recent experiments have disclosed these facts, and while the movement looking to the arsenical ores in the manner just described is yet in its infancy, the gentlemen who are promoting it have abundant means with which to subject the discovery to a practical test. Should the results prove satisfactory, steps will be taken at once to put up a plant for the treatment of arsenical ores, the projectors believing the supply now lying idle in the bonanzas sufficient for immediate wants, and relying on the disclosures of the future to render it as permanent as are the other branches of a great industry.

It is generally known, too, that where the arsenic has appeared the auriferous values of the ore have improved—another of those incomprehensible decrees of nature—and while overcoming an element with which the cyanide has so stubbornly refused to affiliate, the average value of the output of Mercur and Sunshine should be accordingly improved.

BEAVER-WALRUS INCORPORATION. — G. B. Norman, Park City; A. G. Lamson, Boston; T. Marshall, J. E. Gnligher, J. W. Moffatt, C. T. Stevenson, of Salt Lake, form the Beaver-Walrus Mining Company. Capital stock, $500,000. Property consists of the Beaver, Walrus and Cottontail claims in West Mountain mining district, Salt Lake county.

COLORADO.

LA PLATA DISTRICT. — (Special correspondence).—In the spring of '94 a boom struck the mountains, which did more harm than good, causing an influx of that class of prospectors who are quick at locating and recording but abhor work as something out of the question. Now that class has gone, and the prospectors left have settled down to hard work.

The ores of La Plata mountains are chiefly low grades in big veins. The gold is associated with iron, which in many instances has oxidized so as to leave the gold in a practically free state. A few locations carrying copper or galena have been or are worked on the west side of La Plata river, but in these the percentage of the baser metals is low and the valuable metals seemingly replaced, rendering the claims unprofitable for working. At the head of La Plata river the silver values predominate, the veins carrying but little gold. Extensive works here show that some years ago silver mining was carried on on a large scale, but now the mines are shut down and the works closed.

Here, as in any other camp that has a history, one can see monuments of early mistakes in the form of mills unsuitable for the ores. There are four or five of these witnesses. Sometimes the mill was built before the ore was found, as in the case of the Oro Fino mine, where $40,000 or more are thrown away; or the kind of mill was shown to be the wrong one, as the Comstock and Lewis mines. The Cyanide mine, on Junction creek, as it now stands, idle and encumbered with attachments, on the other hand, goes to prove that bad management can ruin and make unprofitable the best of processes. The mill is owned by a Lancaster, Pa., company, who also own the Western Belle mine, on Junction creek slope of Mt. Lewis. Here the mistake was made in sending out men to manage the business who knew positively nothing about mining or milling and who were too old or too adverse to learn, and the consequence naturally was, instead of dividends, a complete failure.

The ores are low grades and cannot bear the charges of transportation to and treatment by the Durango smelters, but now, with the treatment charges reasonable and transportation two or three miles instead of twenty-six or more, many properties heretofore impossible to work will now pay well. A saving of $8 to $12 per ton on ores running $25 to $30 per ton is a great item. The Trashler mill has greatly stimulated mining in the La Platas. There are, however, properties not depending on the success of this mill that are being worked.

The Columbus, in Silver Lake basin, is a representative property. It was discovered about three years ago and has been quietly prospected by intending purchasers. The deal is now closed and the work on the property is going on, in sinking shaft and erecting necessary buildings for the housing of men and machinery. The vein on this property is about sixteen feet wide, carrying an average value of $34 per ton. A shaft was sunk 40 feet along the hanging wall last fall, and a mill-run sample from the width of the shaft, or five feet, gave the astonishing result of $300 per ton. The new owners will sink 600 feet and otherwise prospect the property as fast as machinery and men can do it. C. L. Wright is general manager and Jim Montgomery, an old timer, has charge of the mine.

Another property is the Mountain Lily, on the west side of the river. It is owned and worked by D. Shively. Like the foregoing, the ore is tellurium, although of different character. The vein is not more than two or three feet, with a pay streak of six to eight inches. It is quite extensively developed for a prospect and has shipped some good ore, while all indications point to better results.

The Durango Girl, in Waus gulch, on the Junction creek slope, is another tellurium vein, different from the above. The location is comparatively low in a porphyry dike, which cuts through the sedimentary formation in an east and west course. The vein is from two to two and one-half feet wide, consisting of silicous lime and quartz in which the tellurium is found in a solid streak from one-quartor to five inches wide. It is worked by an adit 300 feet long.

A property of different character is the Little Kate, in Basin gulch, on the west side of La Plata river. The ore is here (near the surface, at least) free milling. By several tests it has been demonstrated that about $10 per ton can be saved by amalgamation, and as there is an immense body of such ore, the owners have concluded to erect a 20-stamp mill near the property. Too little work has been done to see whether the ore continues to be "free milling" as depth is gained, but it would certainly be reasonable to suppose that it cannot be the case.

The Baker Contact properties, in the Tiburcio gulch, on the east side of La Plata river, is about the same kind of proposition, differing only so far as the preceding is a vertical vein and the Contact a horizontal vein, with the vein matter of different rocks.

Down in Burnt Timber gulch is a group of prospects on which development is going on. The ore is here, as in the foregoing, iron sulphide disseminated through a big porphyry dike, in which the process of oxidation has penetrated as far as development has progressed. So, like the foregoing, the gold may near the surface be saved by the amalgamation process, but is sure to change when a certain depth is gained.

At the head of Lightner creek are several good prospects, which with some development would probably turn out well. The veins are strong and well defined, and traceable for a long distance. The ores are galena and tellurium with sulphurets of silver mixed in a quartz gangue between porphyry walls.

The above enumerated are only a few of the over one thousand claims in the district, but are taken as showing the different ores and being more developed than the rest.

Several attempts have been made in placer mining along the La Plata river and tributary gulches, but so far without any success. The reason for this failure is not hard to find, when it is known that none of the leads so far discovered carry free gold, but that it in every instance is associated with some base metal. Of course some gold is carried down the gulches from the oxidized surface ores, but not in quantity enough to pay the placer miner. The gold in this way eliminated is also generally too fine and too light to be saved in the boxes.

While the La Plata mountains do not claim any strictly free-milling ores, its large bodies of low-grade refractory ores will some day be handled with profit.

So far only a few larger companies are operating, but with the influx of needed capital and the surface workings replaced by deeper mining, many now worthless prospects will become paying mines.

Durango, Colo., Dec. 21, 1895.

The following is the output of Creede mines for the year 1895 as near as can be given. The output for December is estimated and added to the returns up to December 1st:

Tons of ore	60,011.00
Ounces of gold	6,630.80
Ounces of silver	2,461,652.50
Tons of lead	3,727.20
Tons of zinc	122.00

AT WARD.—The Columbia has started up again under Superintendent Parmeter, paying $3 a day, all differences over wages having been settled.

HALF INTEREST IN THE BELDEN MINE SOLD.—A one-half interest in the Belden mine at Gilpin, in Eagle county, is sold for $600,000 by A. A. Macdonald to New York and Brooklyn purchasers. This is the largest sale made in that section of the State for a number of years. It is claimed that the reports of experts to the new purchasers are to the effect that $7,000,000 worth of ore is in sight.

NEW MEXICO.

PINOS ALTOS. — Spiller and McLean are working 25 men on the Pacific Company's claim. The ore is being hauled to the company's mill at Silver City and keeps 20 stamps constantly at work, with good results in gold bullion.

MOGOLLON.—The Colonial Company is employing 14 men on the Last Attempt mine and 26 men on the Maud S. The two mines furnish sufficient ore to keep the mill running steadily.

The Confidence is producing 70 tons per day, which is reduced at the mill, turning out $30,000 per month in gold and silver.

ARIZONA.

A *Globe* paper reports that the Old Dominion Copper Mining and Smelting Company blew in the first furnace last Wednesday. Supt. McLean has 100 men employed in development work. The three compartment shaft is down about fifty feet below the eighth level. The stopes on nearly all the levels look well, and can easily supply ore to keep three furnaces running.

Yuma *Sentinel:* The report of Manager R. M. Reymond states that the cyanide plant was run steadily during the month, and operations progressed very smoothly. The wire tramway has handled the pulp easily and very satisfactorily. The lumps of slimes and layers of these in the beds gave some trouble, but arrangements are being completed to make the treatment of these more satisfactory. During the month the storage water tanks were moved from the stamp mill to a considerable elevation above the cyanide plant, and a good pressure and supply thus secured for sluicing the pulp from the vats after treatment. The mine water is also pumped to these tanks and used for sluicing. Two men on the night shift sluice out the residues very readily. Sluice boxes from the vats were put in, and a canvas roof put over the ore vats, which keeps them in better condition. The precipitation in the zinc boxes has been very satisfactory. They have been rather crowded and the box intended for the waste solutions had to be used for the stock solutions. Another box will be put in at once, and the low solutions running to waste will first be passed through this. The amount trenting and the returns are as follows: Pulp treated, 3,973 tons; assay value of pulp $4.10 per ton; assay value of residue, $0.78 per ton; proportion extracted according to assays, eigthy-one per cent; according to bullion, seventy-six per cent; gold precipitated, $12,000; cost of treatment, $5100; extraneous expenses, $1100; balance, $5800. Adding miscellaneous revenue, $300, the net profit for the month was $6100.

YAVAPAI COUNTY.

Journal-Miner: Joseph Meyer is running five stamps of the Henrietta mill. During a twenty-four hours' run recently he took out seven pounds of amalgam from the plates the product of these five stamps. As soon as some repairs can be made to the machinery five more stamps will be started up.

THE UNITED VERDE.—Jerome *News:* The United Verde Copper Company is a close corporation and the public know nothing of their inside workings; but there is no necessity of the hooks of the concern being opened to the public, as a trip through their smelters and over their trails, and the fact that they carry from 500 to 700 men on their payroll, will satisfy the most skeptical that there is a most wonderful mineral vein in this mining district. Again, the report is, and it has been said that the report is undoubtedly true, that this mine netted $3,500,000 for its owners last year. There can be no value placed on this property by those outside of the company, and the owners will not name a price, even if they are capable of so doing, and it is doubtful if there is any person, excepting perhaps Joseph L. Giroux, the superintendent, who has any idea of how much money these mines are really worth. Last week, while the Standard Oil Company's mineral experts were in Jerome, they were asked why they did not take a look over the United Verde Company's plant. They answered that there would be no use, as their company had asked Mr. Clark to name his price, but had been told the plant was not for sale.

LOWER CALIFORNIA.

A wealthy mining man of San Diego, lately returned from the mining camps of Lower California, says there are miners who would put off to Africa or some other distant country if they thought they would find a good mine when they got there, but that there is no comparison between Lower California and that other country as regards mineral wealth and the ease and convenience with which placers or ledges may be worked or developed. The quartz mines at Jacalitos and other camps in that part of the country are promising, and prominent men of Ensenada are largely interested there. W. E. Howard of San Diego and a company of Los Angeles men are about to begin operations on 500 acres of placer ground there, and will spend $15,000 in getting under way. There is the greatest harmony existing between the Mexican officials and the Americans on the peninsula.

TO WORK THE JUAREZ PLACERS.—*Lower Californian:* P. L. Griffin, the president and manager of the Pyramid Mining Co., a Los Angeles corporation, arrived in Ensenada on the Pacheco Tuesday morning. He came down for the purpose of paying the Mexican Government $2310 on the 231 mining pertenencias or placer claims—at the rate of ten dollars per claim—which he denounced for his company four months ago in the Juarez district. This is the largest sum of money ever paid into the Government by a mining company at one time in this section, and as there were not sufficient stamps in the local stamp office for the patents an order had to be telegraphed to the City of Mexico.

The claims of the Pyramid Co. occupy about 800 acres, embrace a small valley and include some of the best placer ground at Juarez. A creek, in which a continuous stream flows, runs through a portion of their property, and from this stream they propose to develop their water supply. A large amount of money will have to be expended and a great deal of work done before they can begin separating the gold from the gravel, but the promoters have no misgivings as to the ultimate results of the enterprise.

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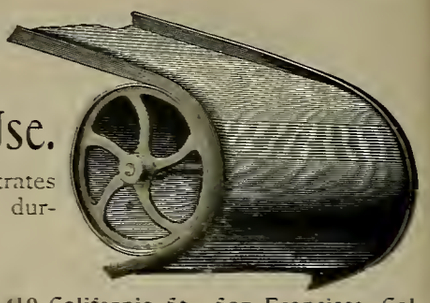
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RISDON IRON WORKS,

SAN FRANCISCO, CAL.

READ WHAT MINERS THINK OF THE BRYAN IMPROVED ROLLER QUARTZ MILL AND JOHNSTON CONCENTRATOR.

OFFICE OF THE CANDELARIA CONSOLIDATED MEXICAN MINING CO.
SAN DIMAS DURANGO, MEXICO, October 25, 1895.

RISDON IRON WORKS, San Francisco—Gentlemen: Our company has been operating three of the 4-foot Bryan Roller Quartz Mills, one of which has been running steadily for three years, one for two and one for one year. Our quartz is very hard; we crush through a No. 6 mesh screen. Our mills run 85 revolutions per minute, and each crush through 60-mesh screens 12 tons in 24 hours; through 50-mesh, 15 tons, and through 40 mesh, 18 tons. This proportion has been continuous.

One set of dies will crush from 1500 to 1800 tons.

One set of tires will crush 1500 tons.

One ring plate will crush from 2200 to 2300 tons.

The mills require very little attention. At our mill an ordinary "peon," earning one dollar per day, has complete charge.

In regard to slimes, in comparison with stamps, by reason of the discharge surface and the continuous agitation by the scrapers, a MUCH less amount of slime is created. A three years' experience teaches me that, in every respect, the mills are a complete success, and of material benefit to the mining world. They can be set up and running in forty-eight hours and can be dismounted in the same time and removed to wherever desired. Ours were packed on our mule trail, over as difficult a road as any in Mexico. As a gold amalgamator it is unequaled by any mill now in existence. Yours truly,

D. M. BURNS, Superintendent.

BULLION-BECK AND CHAMPION MINING COMPANY.
EUREKA, UTAH, August 24, 1895.

THE RISDON IRON AND LOCOMOTIVE WORKS, San Francisco—Gentlemen: Referring to contract made by you with the Bullion-Beck and Champion Mining Company, by which you were to furnish one 5-foot Bryan Roller Quartz Mill on four months' trial, in competition with the Huntington Mill, would say that we have made the test, and the Bryan Mill has proven so greatly superior on all points claimed, viz., capacity and economy, that we have ordered a second Bryan Mill from you and have concluded to discontinue the use of the Huntington Mill.

Yours truly JOHN BECK, Pres.

SIMON BAMBERGER, Director. [Copy.] W. J. BEATIE, Sec'y.

BULLION-BECK AND CHAMPION MINING COMPANY
EUREKA, UTAH, Aug. 24, 1895.

THE RISDON IRON AND LOCOMOTIVE WORKS, San Francisco—Gentlemen: In February last, in connection with the five-foot Bryan Roller Mill which we took from you to test in competition with the Huntington Mill, we also took a six-foot Johnston Concentrator to be tested with ten Frues, one end shake with four belts and one side shake Woodbury. We have been working these machines since the mill was completed, at such times when we had sufficient water.

The terms on which the test was made was that the machine doing the most satisfactory work should be accepted and the others taken out. This did not apply to the Frue, as they were purchased with the plant. In compliance with this agreement, we now inform you that the Johnston Concentrator has proved so superior over the other machines that we now order from you four more of the Johnston Concentrators. Yours truly, JOHN BECK, Pres.

SIMON BAMBERGER, Director. W. J. BEATIE, Sec'y.

GREAT SALT LAKE AND HOT SPRINGS RAILWAY.
S. BAMBERGER, President and Manager.
SALT LAKE CITY, UTAH, October 10, 1895.

R. R. TAWNDRAW, Esq., care Guyer Hot Springs, Ketchum, Idaho—Dear Sir: In reply to yours of the twenty-eighth of September, we have been using at the Bullion-Beck Concentrating Works, Frue Vanner, Woodbury and Johnston machines, side by side for the last four months, and after a thorough trial of all of them, we concluded that the Johnston Vanner was doing the most accurate work and was the best; hence, we bought four more Johnston machines and shall continue to use them in preference to any other.

You will find it the easiest regulated machine and very much easier set up than either of the other machines. We bought our machines from the Risdon Iron Works, of San Francisco, where Mr. Johnston, the patentee, personally superintends the manufacturing of them.

Hoping you will make a success, I remain, Yours truly,

Copy.] [Signed] SIMON BAMBERGER.

THE GOLD VALLEY MINING COMPANY OF SAN FRANCISCO.
C. C. McIVER, President; D. CUSHMAN, Secretary.
MISSION SAN JOSE, CAL., Oct. 17th, 1895.

RISDON IRON AND LOCOMOTIVE WORKS, San Francisco—Gentlemen: We take great pleasure in having to inform you that, after a careful investigation extending over a six weeks' steady run alongside of six other concentrators, the Johnston which you put in for us was the only machine from which you could not find a loss in the tailings. It has done all you claim for it and has proved more than satisfactory. We intend replacing all our other concentrators with Johnston's, as we are convinced they will pay for themselves many times over in a year. CHAS. C. McIVER, President.

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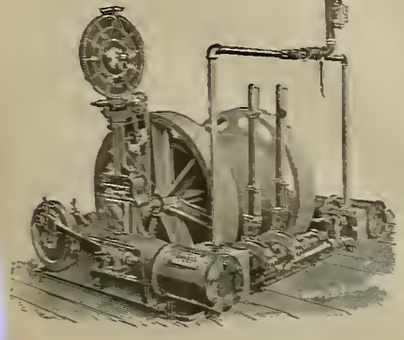
Parties desiring to remove large quantites of Sand, Gravel, Earth, Ore, Rock, etc., to construct levees, dams or embankments, or to make long cuts, as in canals, ditches, etc., can do more efficient work at less cost by the HALLIDIE SYSTEM OF ROPEWAY TRANSPORTATION than by any other system.

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Lead and Copper Smelting Furnaces and Converters,

Frue Vanner Concentrators, Hydrometric Sizers, Crushing Rolls,
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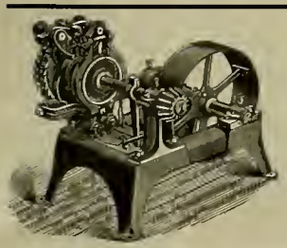
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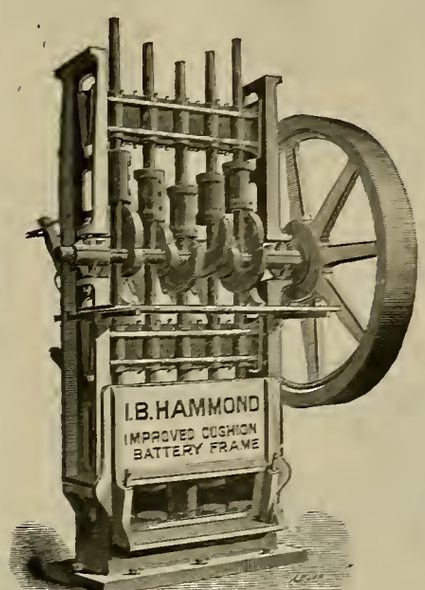
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Patented in the United States and Foreign Countries.

The Improved, Iron-Frame, Self-Contained, Cushion-Frame, Five-Stamp Mill Saves Bills for Heavy Timbers, Millwright and Mechanics' Labor, and a Large Amount of Space. The term "Self-Contained" Means a Great Deal to the Mine Owner, and Can Be Readily Recognized and Appreciated in Making an Estimate For an Ordinary Five-Stamp Plant, When the Comparative Cost is Considered Over a Wood-Frame Mill.

FIRST: There is Saved by the Use of This Mill a Large Bill for Heavy Timbers, in Many Instances Obtained at Great Expense and Loss Of Time.

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We refer by permission to Mr. N. A. McMillan, Baker, Oregon, manager of the Bonanza Mountain Mining Co. at Rock Creek, Or., where ten of our stamp mills are in operation; also to Mr. John S. Miller, Helena, Montana, manager of the Diamond Hill Mining Co., operating one of our forty-stamp mills at their mines at Townsend, Montana.

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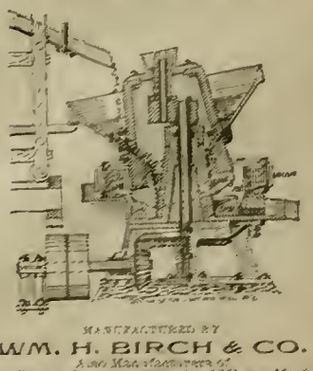
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Coast Industrial Notes.

—The narrow-gauge road between Colfax, Grass Valley and Nevada City has made a general reduction in fare.

—The creosote plant at Ballona, through which the piling at that place was treated with creosote, is to be removed to this city.

— The University of California will shortly expend $250,000 in the erection of three buildings for the use of the affiliated colleges in the western part of San Francisco.

—The merchants of Seattle, Wash., have made an offer to the Hawaiian planters. They are willing to furnish a site for a sugar refinery, remit State and county taxes for a term of ten years, and offer other inducements. The idea is to ship raw sugar to Seattle and refine it there. The vessels would return with merchandise or freight.

—The work of building two new composite gunboats for the United States Navy has been begun by the Union Iron Works. They are twin-screw steamers, 174 feet in length, 34 foot beam, 12-foot draught, engines 800 horse-power, speed 12 knots. Each will carry 6 four-pound, 4 six-pound and 2 one-pound rapid fire guns

— The rate war to Portland between the Southern Pacific and the O. R. & N. which has been in progress about a month is ended. The Southern Pacific officials here decided to advance rates from this city to Portland on the 25th and from Portland to San Francisco on the 24th ult. The first class rate of $10 will be raised to $15, and the second-class rate of $5 to $7.50.

—The Harbor Commissioners have awarded contracts for the work on the new Union Depot at the foot of Market Street, this city, as follows: C. F. McCarthy, stonework, $230,000; steel and cast-iron work, Risdon Iron Works, $188,000; carpenter and glazing work, Bateman Brothers, $48,400; plumbing and gas fitting E. J. Duffy, $11,123; roofing, etc., Wm. Cronan, $43,999; painting, George Smith & Son, $12,900.

— A dispatch from the city of Mexico says A. C. Butler of South Africa has arrived there with a letter of credit of $15,000,000 from Barney Barnato and Cecil Rhodes of South Africa. It is said that he has made an investment of several million dollars in the drainage tunnel which the Government has under way and in the city waterworks and has also taken an option upon the street railway system for $7,000,000, and is attempting to buy up the copper properties in the country. There is probably as much truth in this as in the similar statement that Barnato was going to immediately invest $15,000,000 in Cripple Creek, Colorado, properties.

—The Interstate Commerce Commission has announced its decision in the case of the Colorado Fuel and Iron Company against the Southern Pacific Company, and others carriers, relating to the legality of rates on steel rails and other iron and steel articles from Pueblo, Colo., to San Francisco. The complainant alleged that an unreasonable charge of $1.60 per 100 pounds was made on these articles, while the rates from the East were much less. The Commission held that the rates complained of were unreasonable and unjust, and ordered that the rates from Pueblo to San Francisco should not exceed 45 cents per 100 pounds on steel rails and fastenings, and 37½ cents per 100 pounds on similar articles of iron, and that the rates shall never exceed 75 per cent of those charged on like traffic from Chicago to San Francisco.

Personal.

HENRY T. SCOTT has returned from Washington.

J. T. DONNELLAN is president of Salt Lake, Utah's, new mining exchange.

JOHN H. KLOCK, who has been in Chicago for three years, is again employed as assayer at the Blue Bell, Ainsworth, B. C.

HENRY SCHLUND, assayer and chemist for the Mountain Mining Co. of Keswick, Shasta Co., perished from exposure while out hunting on the 16th.

CONGRESSMAN S. S. AITKEN of Michigan has been appointed by Speaker Reed chairman of the Congressional Committee on Mines and Mining to succeed T. A. E. Weadcock of Michigan, the chairman of that committee in the 53rd Congress.

SEVERAL changes will be made in San Francisco in '96 in the station and duties of army engineers. Colonel Charles R. Sutte, member of the Mississippi River Commission, is made division engineer of the Pacific division, with headquarters at San Francisco, in place of Colonel Mendell, recently retired. He will be succeeded at St. Louis by Lieutenant-Colonel Amos Stickney, also a member of the Mississippi River Commission. Major William H. Heuer, in charge of the river and harbor work at Humboldt bay, has been transferred to Cincinnati as relief to Lieutenant-Colonel Stickney. Major C. F. L. B. Davis, now on duty at Washington, succeeds to the duties vacated by Major Heuer. Major Thomas H. Handbury, in charge of the works in Florida, will take the station at St. Louis as relief to Major Charles J. Allen, who succeeds Major Davis at Washington. Lieutenant-Colonel H. H. Benyaurd, now in this city, is ordered to relieve Major Handbury at St. Augustine, Fla.

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List of U. S. Patents for Pacific Coast Inventors.

Reported by Dewey & Co., Pioneer Patent Solicitors for Pacific Coast.

FOR THE WEEK ENDING DECEMBER 17, 1895.

551,441.—ORE FURNACE—H. P. Holland, S. F.
551,491.—SOLDERING MACHINE—M. Jensen, Astoria, Ogn.
551,502.—STATION INDICATOR—C. E. Larrabee, Berkeley, Cal.
551,445.—STEP LADDER—H. Liefer, Los Angeles, Cal.
551,732.—EVAPORATOR—H. A. Merriam, Los Gatos, Cal.
551,683.—CAR TRUCK—R. F. Minor, Heppner, Ogn.
551,400.—PUMP—E. T. Nichols, S. F.
551,735.—PULLEY BLOCK—H. Orrock, S. F.
551,447.—DOUGH MIXER—J. R. Phelps, Marysville, Cal.
551,402.—PENCIL SHARPENER—A. Prader, Spokane, Wash.
551,560.—ORE CRUSHER—A. H. Schierholz, S. F.

NOTE.—Copies of U. S. and Foreign patents furnished by Dewey & Co. in the shortest time possible (by mail for telegraphic order). American and Foreign patents obtained, and general patent business for Pacific Coast inventors transacted with perfect security, at reasonable rates, and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS U. S. and Foreign Patent Agency, the following are worthy of special mention:

SOLDERING MACHINE.—Mathias Jensen, Astoria, Or., assignor of one-half to the Jensen Can Filling Machine Co. No. 551,122. Dated Dec. 10, 1895. This invention relates to that class of machines in which the cans are rolled forward by an endless chain while being soldered. Its object is to save solder and make neater work in soldering the end seams of round cans. It consists of a tank extending longitudinally along the supporting frame; a revoluble roller submerged longitudinally in the tank, so that its upper surface supports one end of the can, whereby the solder is applied to the end seam where the can rolls over it. The opposite end of the can is supported by the tank, and an endless chain is made to travel with its lower fold in contact with the upper surface of the can, so as to roll the can forward in a direction at right angles with the rotation of the soldering roller. A revoluble wiper is journaled in the path of the cans, so as to remove the surplus solder after they leave the soldering roller. A shield extends over the wiper close above the lower fold of the chain, to prevent the can being thrown out of place by the action of the wiper. The shaft of the soldering roller passes through the end solder trough or tank by means of a stuffing-box surrounding the shaft and filled with an indestructible packing material, which prevents the escape of the solder but allows the shaft to pass outward, where by suitable mechanism it and the roller are rotated. The wiper consists of a series of flexible leaves, and the arms of the wiper are provided with suitable adjusting devices.

SWITCH FOR UNDERGROUND ELECTRIC RAILWAYS.—Alfred Rosenholz of San Francisco, Cal., assignor of one-half to Samuel J. Clarke and Harvey S. Brown of same place. No. 551,145. Dated Dec. 10, 1895. This invention relates to a device which is especially applicable for use upon electric railways in which the conducting and trolley wires are carried along beneath the surface of the ground. The object of the invention is to provide an automatic means for cutting off the electric current in case the tube within which the parts are arranged becomes flooded so as to prevent the loss of electricity, and in a means for so actuating the switch that under ordinary conditions the current of electricity will be transmitted from the main conductor during the time in which a car is moving over the section of trolley wire which is thus energized. It consists of a stationary magnetic core projecting at right angles with the main conductor, a sealed insulated casing enclosing the core and movable with relation thereto about the main conductor, a trolley wire supported from the movable end of the casing and connected with a contact plate adjacent to the free end of the core, and means for making contact when the casing is depressed so that the electric current will be transmitted during the time when the casing is depressed, the casing being immediately tilted in the opposite direction as soon as the core leaves that portion of the trolley. The whole device is suitably insulated and a float is so connected with a locking arm that in case the tube or tunnel should be flooded with water the float would rise and throw the locking arm into engagement so as to prevent any movement of the casing to allow the passage of the electric current from the main conductor and consequent loss thereof.

SOLDERING MACHINE.—Mathias Jensen, Astoria, Or., one-half assigned to the Jensen Can Filling Machine Co. of Oregon, of same place. No. 551,491. Dated Dec. 17, 1895. This invention relates to improvements in soldering machines. Its object is to remove the surplus solder from the end seams of cans after being soldered by an ordinary soldering machine. It consists of a carrier for the cans, oscillating wipers in the path of the cans, arms carrying the wipers having shafts and springs acting on the shafts to hold the wipers in normal and yielding contact with the cans, and means whereby the arms may be moved and the wipers adjusted to and from the cans, and mechanism for operating the carrier. It also comprises a heating chamber in contact with which the cans move, so that the solder is prevented from becoming hard while it is being removed by the wipers.

DEPARTMENT OF THE REGISTRAR OF PATENTS, South African Republic.—Application for improvements in traction engines—Registered No. 1004 (official Dutch title verbeteringen aangebracht in locomobielen).

Notice is hereby given for general information that Daniel Best, residing at California, America, deposited on the 29th day of October, 1895, at my office, an application for letters patent for the invention above named, with specification relating thereto.

Now, whereas the said D. Best has given me written notice that he wishes to proceed with his application, I have decided that all objections thereto shall be filed at my office before Friday, the 14th day of February, 1896, at 3 o'clock P. M., after which time the Attorney-General will fix the date of bearing.

I therefore summon all persons interested in objecting to a patent being granted for the above named invention to the above mentioned D. Best to deposit with me a document clearly setting forth their objections before the aforesaid date, as they will otherwise be excluded from submitting the same.

Done this 29th day of October, A. D. 1895, at Pretoria, South African Republic.

(Signed) CARL VECKERMANN, SR.
Registrar of Patents.

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MANUFACTURERS AND BUILDERS OF
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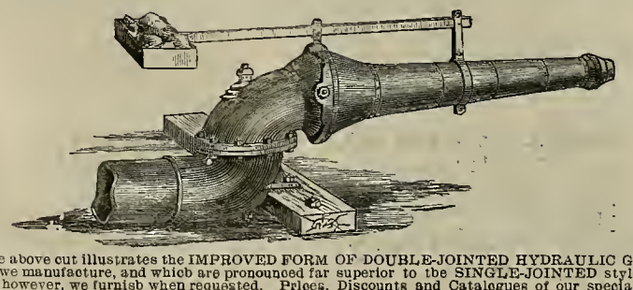
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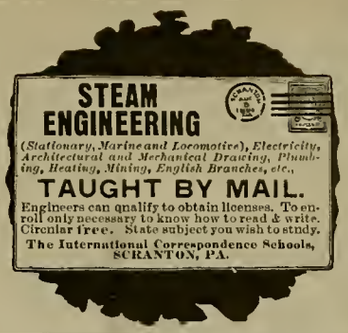

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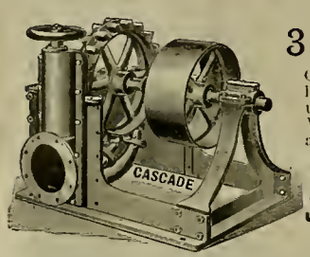
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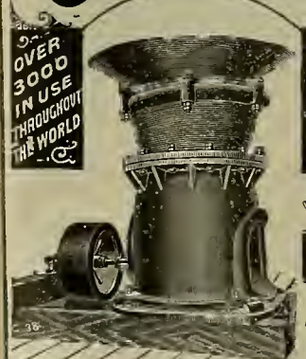
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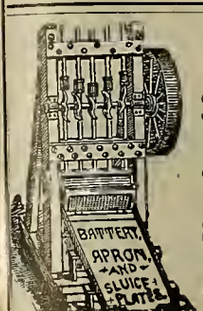
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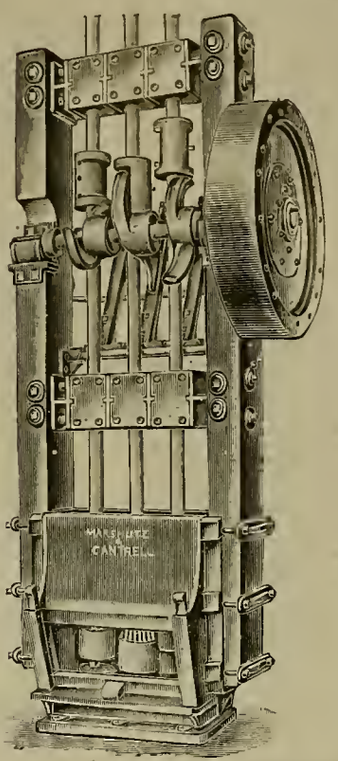
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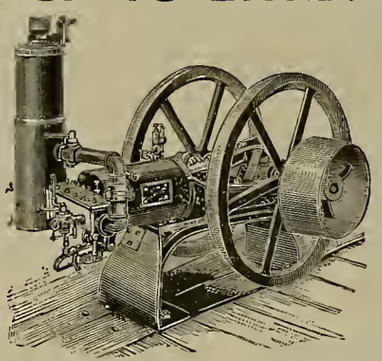
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Coal Gas, ten hours' run, 1000 feet	$2 00
Gasoline (74 deg.), ten hours' run, 8¾ gallons @ 14c	1 25
Coal Oil, ten hours' run, 7½ gallons @ 10c	75
Crude Petroleum, asphaltum base, 16 gallons @ 3c	48
Crude Petroleum (36 deg.), paraffine base, 13 gallons @ 5c	65

On the crude petroleum with asphaltum base we had an over-product of 7 gallons of asphaltum; the market price is 3 cents per gallon—21 cents. This deducted from the first cost of the crude petroleum for ten hours' run leaves a net balance of 27 cents. And from the crude oil with a paraffine base we had an over-product of 3 gallons of good lubricating oil, which we consider equal to any we have ever used, but will estimate its value conservatively at 20 cents per gallon, making 60 cents; this deducted from the first cost of the crude oil leaves a balance of 5 cents, total cost of running ten hours.

It will be readily seen that the operation of these Engines with crude petroleum reduces the cost of operation to a minimum. Crude petroleum with paraffine base at 1-10c per horse power per hour; on crude petroleum, asphaltum base, ¼c per horse power per hour; on domestic coal oil, 1½c per horse power per hour; and on gasoline, 2½c per horse power per hour.

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Market Reports.

The Markets.

SAN FRANCISCO, Dec. 26, 1895.

The statements of last week apply with equal truth to the present status. The market is "slow and interesting." When all hands get through squaring up accounts prices will cease to recede and checked negotiations will be renewed after New Years. The talk of the past two weeks has had no more to do with it than the comet. It is the dull season, when few care to load up, and every merchant and manufacturer is taking account of stock. Silver is the steadiest of anything on the list. Conditions that affect the world of business have little influence on the accumulative propensity of the Orientals. As with silver, so with gold, so far as India is concerned.

Between 1859 and 1889, thirty years, or less than half one lifetime, India has absorbed £117,000,000 in gold and £227,000,000 in silver, or £344,000,000 in all. What has become of the silver no one knows exactly, though it is certain that a great proportion of it is hoarded as fixed and valuable wealth, but about the destination of the gold there is no doubt at all. The people have got the whole of it in their own hands, for it is not in circulation, and are using it either in ornaments, kept, be it observed, to pawn in extremity, or as hoarded treasure in coin such as lies under almost every peasant's floor in the Punjaub and Eastern Bengal. India is a treasure house of gold, yet a man may live 50 years in the British provinces and never see an ounce.

New York Metal Market.

NEW YORK, Dec. 26.—PIG IRON—Southern, 12@12.50; Northern, 12@13.00.

COPPER — Brokers', 10.50c; exchange, 10.60c.

LEAD—Brokers', $3.15; exchange, $3.25.

TIN—Straits, 13c@13.50c.

SPELTER—Domestic, $3.40.

The local hullion, money and exchange quotations current are as follows:

Commercial Loans, % per annum	7@8
Commercial Loans, prime	6@8
Call Loans, gilt edged	7@8
Call Loans, mixed securities	7@8
Mortgages, prime, taxes paid by lender	6@8
New York Sight Draft	20c
New York Telegraphic Transfer	25c
London Bankers' 60 days	$4.89
London Merchants	$4.89
London Sight Bankers	$4.90½
Refined Silver, per oz., 1000 fine	66⅜c
Mexican Dollars	54c

New York Silver Prices.

NEW YORK, Dec. 26.—Following are the losing prices for the week:

	Silver in London.	Silver in N. Y.	Copper.	Lead.
Friday	30⅝	66⅜	10 50	.....
Saturday	30½	66⅜	10 50	3 15
Monday	30½	66½	.....	3 20
Tuesday	30⅝	66½	.....	.....
Wednesday	Holiday.			
Thursday	30½	66⅜	.....	.....

San Francisco Metal Market.

COPPER.

Bolt	½ & 5-16, 21c; ⅜ and larger, 22c		
Lake Superior Sheathing		23 @	—
Ingot, jobbing		— @	19
Ingot, wholesale		18 @	—
Sheet copper		— @	22

ZINC.

Sheet		9½@	

LEAD.

Pig		— @	3 85
Bar		— @	4 15
Sheet		— @	5 50
Pipe		— @	4 75

SHOT.

Drop, sizes *smaller* than B, per bag of 25 lbs			$1 40
Drop, B and *larger* sizes,	"	"	1 65
Buck, Balls and Chilled, do,	"	"	1 65

IRON.

American Soft		22 00 @	26 00
Pig, per ton		18 00 @	20 00

STEEL.

English, lb		16 @	19

COKE.

Gas Companies'		75c ₱ bbl.	
English, to load		9 00 @	10 00
" spot, in bulk		— — @	13 00
" in sacks		— — @	15 00
Cumberland		9 00 @	— —

ANTIMONY.

Per lb		— @	10

PIG TIN.

Per lb		15 @	16 00

QUICKSILVER.

Home trade, per flask		39 00 @	40 —

BORAX.

Refined, in car lots		— @	5⅛
Refined, in sacks and barrels		— @	5⅜
Powdered, in car lots		— @	5⅜
Concentrated, "		— @	4⅞

TIN PLATE.

Per bx		4 75 @	5 00

ZINC.

Sheet		8½@	

NAILS.

Wire			$1 75
Cut			1 50

LUMBER.

SAN FRANCISCO — WHOLESALE.

Redwood, Fluming		17 00 @	— —
Pine		13 00 @	18 00
Spruce		25 00 @	30 00

COAL.

SPOT FROM YARD—PER TON.

Wellington	$ 8 00
Greta	7 50
Nanaimo	7 00
Gilman	6 50
Seattle	6 00
Coos Bay	5 00
Canusl	8 50
Egg, hard	10 00
Wallsend	7 50
Scotch Splint	6 50
Brymbo	7 50

TO ARRIVE—CARGO LOTS.

Australian	5 35
Liverpool Steam	5 87
Scotch Splint	6 50
Cardiff	6 00
Lehigh Lump	9 00
Cumberland	8 50
Egg, hard	10 00
West Hartley	6 50

MINING SHAREHOLDERS' DIRECTORY.

Compiled Every Thursday from Advertisements in the Mining and Scientific Press and Other San Francisco Journals.

ASSESSMENTS.

Company and Location.	No.	Amt.	Levied,	Delinq't and Sale.		Secretary.
Best & Belcher M Co, Nev	59	25c	Nov 4,	Dec 9,	Dec 30	M Jaffe, 309 Montgomery
Bullion M Co, Nev	46	10c	Nov 4,	Dec 9,	Dec 30	R R Grayson, 331 Pine
Bulwer Con M Co, Cal	11	5c	Oct 29,	Dec 4,	Dec 31	C E Elliot, 309 Montgomery
Challenge Con M Co, Nev	20	5c	Dec 20	Jan 22,	Feb 12	C L M'Coy, Mills Building
Con Cal & Va M Co, Nev	5	25c	Nov 22,	Dec 28,	Jan 16	A W Havens, 309 Montgomery
Confidence M Co, Nev	26	30c	Nov 13,	Dec 18,	Jan 8	A S Groth, 414 California
Chollar M Co, Nev	41	25c	Nov 12,	Dec 17,	Jan 7	C E Elliot, 309 Montgomery
Gold Bar Con M Co, Cal	2	3c	Nov 5,	Dec 21,	Jan 16	E C Godfrey, Crocker Building
Gould & Curry S M Co, Nev	77	15c	Nov 5,	Dec 10,	Dec 30	A K Durbrow, 309 Montgomery
Hale & Norcross S M Co, Nev	108	15c	Dec 10,	Jan 15,	Feb 7	A B Thompson, 309 Montgomery
Hite G M Co, Cal	2	10c	Dec 17,	Jan 26,	Feb 10	H E Mathews, 138 Sutter
Jamison M Co, Cal	7	3c	Nov 9,	Dec 16,	Jan 6	S W Cheyney, 120 Sutter
Marguerite M Co, Cal	1	10c	Nov 2,	Dec 2,	Jan 5	Chas. Winters, 237 12th St., S F
Mexican M Co, Nev	53	25c	Nov 19,	Dec 23,	Jan 14	C E Elliot, 309 Montgomery
Occidental Con M Co, Nev	21	15c	Dec 17,	Jan 20,	Feb 10	Alfred K Durbrow, 309 Montgomery
Ophir S M Co, Nev	67	25c	Nov 5,	Dec 9,	Dec 30	E B Holmes, 309 Montgomery
Overman S M Co, Nevada	74	10c	Dec 2,	Jan 6,	Jan 27	G D Edwards, 414 California
Superior M & M Co, Cal	1	5c	Nov 5,	Dec 9,	Dec 30	J Howard Barnard, 916 Market, S F
Yellow Jacket M Co, Nev	60	25c	Nov 12,	Dec 17,	Jan 22	W H Blauvelt

Mining Share Market.

SAN FRANCISCO, Dec. 26, 1895.

As usual to the mid-winter holiday season, business has been dull. Outside of cross-orders, legitimate transactions were light up to Monday when there was more doing, which resulted in fairly active trading on Tuesday at slightly higher prices. The up-move was confined largely to the shares of the mines working on the Brunswick lode. The strengthening of the market caused the more timid of the short-sellers to fill, proving that over Christmas still better things may be reported from the mines, which might provoke stronger buying and cause quite an advance along the entire line. While this is greatly to be desired, yet conditions do not seem to be favorable for a decided advance. The suits must be entirely out of the way before money-eyed men will venture in, for it is only human not to invest without first knowing there will not be any suits or chances for losing money through decisions of the suits now in court. How long these suits will hang, it is hard to say, but just so long the trading public need not expect anything more than false moves, which will early in next year be followed by assessments. The latter are always assured even if expected ore fails to materialize in sufficient quantity to admit of dividends. There is hardly a mine on the Comstock lode but is taking out more or less, and some high grade, yet the market hangs as if loaded down with lead. A few brokers and outsiders make spasmodic efforts to galvanize life into it, but after selling a few shares and getting some of the shorts to fill, they let go and the "let go" is worse than if no go had been made by them. Even activity in Colorado gold mining fails to enliven affairs, neither has the presence of the president of the Comstock Tunnel Co. Everything or anything that would have renewed active trading at advanced prices a few years ago fails in producing any effect now.

The news from the Comstock mines is to the effect that fairly good work is being done all along the line. In the Alta group there is no material change since last week's advices. The work is of a promising character, but there is too much promising and not enough of practical results in the way of finding a body of ore. In the Gold Hill group the work is still to the west in some, while in others work is being done to place them in better condition for more active work in 1896. In Overman, Belcher, Seg. Belcher, Crown Point, Yellow Jacket, Challenge, Confidence, Con. Imperial and Alpha the work is being closely watched, but it all points to time and more assessments. These mines are being put in splendid working condition for the 1896 campaign. The expected strike in Con. Imperial and Alpha is still abead. It is very much like bunting for the pot of gold to be found at the end of a rainbow. It is to be hoped that the strike will not vanish like rainbows and leave the runners for the pot out of breath and in this instance out of money. In Alpha they did make a strike, but it was a flow of water, but even the knowledge of this having been done is some consolation to the wearied assessment-racked public. It has always been claimed that a strike of a big flow of water is an evidence of being near to an ore body. It is to be hoped this will prove correct in this instance, yet Comstock mining is very uncertain. In Potosi, Chollar, Hale & Norcross and Savage ore is found, but not in sufficient quantity to meet current expenses. In Gould & Curry and Best & Belcher the work is essentially unchanged. Con. Virginia reports fair prospects on the several levels, but nothing to excite the cupidity of traders. The work is both exploiting and dead work. In Ophir, Mexican, Union and Sierra Nevada experienced miners seem to be interested in the work under way. But this has been the case for two or three years past without anything of importance being found. Hopes deferred maketh the heart sick, and in this instance it makes both the heart and the pocket sick. Some day, if the work is prosecuted, they are liable to stumble onto a body of ore, and when it is least expected. This has been the history of the Comstock mines, and they say history repeats itself; whether it will with these mines is, as yet, an open question, but assessment repeats itself every little while. Andes is almost forgotten, as is West Con. Virginia. Better things were expected of them.

To the Brunswick lode attention is again being centered, but with little success so far as promoting a boom is concerned. In Occidental on the 750-foot level a strike is reported to have been made, but it will take some time and considerable work to find out what it amounts to. As is the usual case, it was unexpected. Work in the ground owned by Chollar and Hale & Norcross is said to be quite interesting, and good things, aside from assessments, are looked for by some of the miners, but when is the conundrum. Very little is heard from the work going on in the ground owned by the Savage, Con. Virginia and other companies owning ground on the lode.

From the Bodie district nothing new or interesting comes to hand. The big things so confidently looked for about two years ago have not materialized, but steady work is being done in a small way.

The following illustrates the changes of the week:

Mines.	Dec. 19.	Dec. 26.
Alpha	$ 19	$ 23
Alta Consolidated	.....	.....
Andes	.....	.....
Belcher	28	29
Best & Belcher	.....	85
Bodie	38	47
Bullion	.....	19
Challenge	26	.....
Chollar	.....	58
Confidence	.....	1 15
Consolidated California and Virginia	2 00	2 35
Consolidated New York	.....	.....
Crown Point	23	.....
Exchequer	06	.....
Gould & Curry	39	44
Hale & Norcross	84	98
Justice	.....	.....
Mexican	32	64
Ophir	1 30	1 40
Overman	09	10
Potosi	50	56
Savage	30	34
Sierra Nevada	45	54
Union	40	43
Utah	.....	.....
Yellow Jacket	39	42

San Francisco Stock Board Sales.

SAN FRANCISCO, Dec. 26, 1895.

9:30 A. M. SESSION.

100 Belcher	29	1100 Occidental	65
200 Best & Belcher	83	100 Potosi	54
100	84	200	55
50 Bodie	44	100 Ophir	1 40
400 Chollar	58	300 Savage	33
250 H. & N.	97	100	34
100 Gould & Curry	43	100 Sierra Nevada	45
200	44	200 Union	43
500 Mexican	63	100 Yellow Jacket	41

SECOND SESSION—2:30 P. M.

250 Ophir	1 40	100	96
900 Mexican	64	300 Yellow Jacket	42
300 Gould & Curry	44	500 Alpha	23
500 Best & Belcher	85	300 Belcher	29
450 C. C. & Va	2 35	300 Confidence	1 15
300 Savage	34	200 Sierra Nevada	54
200 Chollar	58	500 Bullion	19
200	57	200 Overman	10
100 Potosi	55	100 Savage	34
100	56	200 Occidental	68
300 Hale & Norcross	97	50 Eureka	20
100	98	50 Bodie	47

THE CALIFORNIA DEBRIS COMMISSION having received applications to mine by the hydraulic process from Joe G. De Bons in the Kerr mine, near Yankee Jims, Placer county, to impound tailings in Devil's canyon; from L. M. Sherwood et al. in the Sherwood & Snyder mine, near Chinese Camp, Tuolumne county, to impound tailings in Moccasin creek; from Henry A. Hallsted to the Clay Bank mine, near Meadow Valley, Plumas county, to impound tailings in a ravine; from W. H. Gleon & J. H. Hayden in the Blue Gravel mine, near Rancheria, Amador county, to impound tailings in Rancheria creek; from J. F. Evans in the Emma Harding mine, in Cook's canyon Plumas county, to impound tailings in a swamp; from John Smith in the Roman mine, Mountain Meadows, Lassen county, to impound tailings in a swamp; and from Wiley Sexton in the Kendall mine, near Grizzly Flat, El Dorado county, Cal., to impound tailings in Dogtown creek, gives notice that a meeting will be held at room 92, Flood building, San Francisco, Cal., January 13th, 1896, at 1:30 P. M.

SPECIAL MEETING.—A SPECIAL MEETING of the stockholders of the Sonora Extended Mining Corporation will be held at the office of the company, 213 Jackson street, San Francisco, California, on MONDAY, the 30th day of December, 1895, to consider and order on an offer to purchase the plant of the mine and other property of the corporation, and to authorize and empower the directors to sell the same, and to execute or cause to be executed a proper deed of conveyance of said property to the purchaser.

JOHN METCALFE, President.

Assessment Notices.

CON. CALIFORNIA & VIRGINIA MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Virginia Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors held on the 22d day of November, 1895, an assessment (No. 5) of twenty-five (25) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, Room 48, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 28th day of December, 1895, will be delinquent, and advertised for sale at public auction, and, unless payment is made before, will be sold on THURSDAY, the sixteenth (16th) day of January, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

A. W. HAVENS, Secretary.

Office—Room 48, Nevada Block, No. 309 Montgomery street, San Francisco, California.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Silver Star Mining District, Storey county, Nevada.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 17th day of December, 1895, an assessment (No. 21), of fifteen (15) cents per share, was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of January, 1896, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on MONDAY, the 10th day of February, 1896, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

By order of the Board of Directors.

ALFRED K. DURBROW, Secretary.

Office—Room No. 69, Nevada Block, No. 309 Montgomery street, San Francisco, California.

HITE GOLD MINING COMPANY.—Location of principal place of business, San Francisco, California; location of works, Mariposa County, California.

Notice is hereby given that at a meeting of the Board of Directors, held on the seventeenth day of December, 1895, an assessment (No. 2) of 10c (ten cents) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, 120 Sutter street, Room 27, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 20th day of January, 1896, will be delinquent, and advertised for sale at public auction; and, unless payment is made before, will be sold on MONDAY, the 10th day of February, 1896, to pay the delinquent assessment, together with the costs of advertising and expenses of sale.

By order of the Board of Directors.

H. E. MATHEWS, Secretary.

Office—Room 27, 120 Sutter street, San Francisco, California.

CALIFORNIA STUMP PULLER.



This is a photograph of the Stump Puller at work on redwood stumps on the farm of C. E. Ogburn, Guerneville, California.

In the improved form in which it is now offered to the public, it is universally admitted to be the most practical, powerful and successful machine of the kind in America, and the only machine in existence that can be successfully operated on hill land.

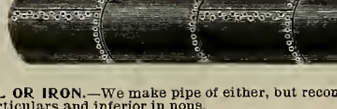
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SACRAMENTO, CAL.

DELINQUENT SALE NOTICE.

SUPERIOR MILL AND MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Placerville, El Dorado County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the 5th day of November, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Cert.	No. Shares.	Amt.
James Black	166	25	$ 1 25
E. J. Bowen	214	200	10 00
F. M. Dickerhoff, Trustee	75	5,000	250 00
F. M. Dickerhoff, Trustee	76	5 000	250 00
F. M. Dickerhoff, Trustee	77	5,000	250 00
F. M. Dickerhoff, Trustee	79	2,000	100 00
F. M. Dickerhoff, Trustee	80	1,000	50 00
F. M. Dickerhoff, Trustee	81	1,000	50 00
F. M. Dickerhoff, Trustee	82	1,000	50 00
F. M. Dickerhoff, Trustee	88	100	5 00
F. M. Dickerhoff, Trustee	89	100	5 00
F. M. Dickerhoff, Trustee	90	100	5 00
F. M. Dickerhoff, Trustee	91	100	5 00
F. M. Dicksrhoff, Trustee	93	50	2 50
F. M. Dickerhoff, Trustee	94	50	2 50
E. K. Dickerhoff	6	50	2 50
A. J. Dickerhoff	7	50	2 50
Thos. B. Douglass	95	25	1 25
F. W. Evaus	8	50	2 50
M. A. Evans	9	50	2 50
Frank Evans	16	25	1 25
Mamie Evans	17	25	1 25
Cora Evans	18	25	1 25
Frank Goyan, Trustee	37	2,000	100 00
Frank Goyan, Trustee	38	2,000	100 00
Frank Goyan, Trustee	39	2,000	100 00
Frank Goyan, Trustee	40	2,000	100 00
Frank Goyan, Trustee	41	2,000	100 00
Frank Goyan, Trustee	42	2,000	100 00
Frank Goyan, Trustee	43	2,000	100 00
Frank Goyan, Trustee	44	1,000	50 00
Frank Goyan, Trustee	45	1,000	50 00
Frank Goyan, Trustee	46	1,000	50 00
Frank Goyan, Trustee	47	1,000	50 00
Frank Goyan, Trustee	48	1,000	50 00
Frank Goyan, Trustee	49	1,000	50 00
Frank Goyan, Trustee	218	750	37 50
Frank Goyan, Trustee	233	1,720	86 00
John Lord	206	75	3 75
D. L. Munson, Trustee	52	140	7 00
D. L. Munson, Trustee	55	800	40 00
D. L. Munson, Trustee	71	100	5 00
D. L. Munson, Trustee	73	177	8 85
D. L. Munson, Trustee	99	250	12 50
D. L. Munson, Trustee	101	200	10 00
D. L. Munson, Trustee	102	200	10 00
D. L. Munson, Trustee	107	100	5 00
D. L. Munson, Trustee	113	50	2 50
D. L. Munson, Trustee	114	50	2 50
D. L. Munson, Trustee	116	25	1 25
D. L. Munson, Trustee	121	500	25 00
D. L. Munson, Trustee	125	100	5 00
D. L. Munson, Trustee	128	12	60
D. L. Munson, Trustee	129	5	25
D. L. Munson, Trustee	130	5	25
D. L. Munson, Trustee	133	20	1 00
D. L. Munson, Trustee	134	20	1 00
D. L. Munson, Trustee	135	20	1 00
D. L. Munson, Trustee	137	5	25
D. L. Munson, Trustee	140	100	5 00
D. L. Munson, Trustee	144	20	1 00
D. L. Munsou, Trustee	150	50	2 50
D. L. Munson, Trustee	155	20	1 00
D. L. Munson, Trustee	156	20	1 00
D. L. Munson, Trustee	162	100	5 00
D. L. Munson, Trustee	163	25	1 25
D. L. Munson, Trustee	183	10	50
D. L. Munson, Trustee	187	5	25
D. L. Munson, Trustee	188	264	13 20
D. L. Munson, Trustee	213	9,265	463 25
D. L. Munson, Trustee	219	1,000	50 00
D. L. Muoson, Trustee	222	55	2 75
D. L. Munson, Trustee	223	2,232	116 15
D. L. Munson, Trustee	1(new)	500	25 00
D. L. Munson, Trustee	2(new)	500	25 00
D L. Mun-on, Trustee	3(new)	600	30 00
D. L. Munson, Trustee	7(new)	20	1 00
D. L. Munson, Trustee	11(new)	300	15 00
D. L. Munson, Trustee	15(new)	22,224	1,111 20
D. L. Munson, Trustee	18(new)	100	5 00
D. L. Munson, Trustee	27(new)	320	16 00
D. L. Munsoo, Trustee	28(new)	46	2 30
W. F. Nelson & Son	24(new)	20	1 00
W. F. Nelson & Son	29(new)	20	1 00
Mrs. S. M. Overton	14	622	31 10
Leander Silvester	120	20	1 00
Leander Silvester	172	10	50
Leander Silvester	173	10	50
Leander Silvester	16(new)	10	50
Crescenta Whituey	19	25	1 25
J. N. Witherow	171	25	1 25
S. L. Waide	4	50	2 50
Cora Waide	5	50	2 50
Milton Waide	11	25	1 25
Ella Waide	12	25	1 25
Artie Waide	13	25	1 25
Howard Waide	14	25	1 25
A. Waide	15	25	1 25

And in accordance with law, and an order from the Board of Directors, made on the 5th day of November, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, No. 916 Market St., room 81, San Francisco, California, on MONDAY, the 30th day of December, 1895, at the hour of 1 o'clock P. M. of said day, to pay said Delinquent Assessment thereon, together with costs of advertising and expenses of sale.

J. HOWARD BARNARD, Secretary.

Office, 916 Market St., room 81, San Francisco, California.

DELINQUENT SALE NOTICE.

GOLD BAR CONSOLIDATED MINING COMPANY.—Location of principal place of business, San Francisco, California. Location of works, Middle Fork Feather River, Plumas county, near La Porte.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 2) levied on the 5th day of November, 1895, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Cert.	No. Shares.	Amt.
L. M. Hoefler	24	2,500	$75 00
L. M. Hoefler	25	2,500	75 00
L. M. Hoefler	88	1,000	30 00
L. M. Hoefler	89	1,000	30 00
L. M. Hoefler	90	500	15 00
L. M. Hoefler	91	100	3 00
L. M. Hoefler	92	100	3 00
L. M. Hoefler	93	100	3 00
L. M. Hoefler	94	100	3 00
L. M. Hoefler	95	100	3 00
L. M. Hoefler	96	500	15 00
L. M. Hoefler	97	500	15 00
L. M. Hoefler	98	500	15 00
L. M. Hoefler	99	500	15 00
Raymond Parry	15	625	18 75

And in accordance with law, and an order from the Board of Directors, made on the 5th day of November, 1895, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of the company, 37 and 38 Crocker Building, San Francisco, California, on THURSDAY, the 16th day of January, 1896, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with costs of ad erlising and expenses of sale.

E. C. GODFREY, Secretary.

Office, 37 and 38 Crocker Building, San Francisco, California.

DELINQUENT SALE NOTICE.

INYO MARBLE COMPANY OF CALIFORNIA.—Location of principal place of business, San Francisco, California. Location of works, Inyo, Inyo county, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 37) levied on the 5th day of July, 1895, the several amounts set opposite the names of the respective shareholders as follows

Name.	No. Cert.	No. Shares.	Amt.
M. J. McDonald, Trustee	234	5,000	$500 00
M. J. McDonald	453	250	25 00
M J. McDonald, Trustee	454	2,823	282 30
Paul Lotz, Trustee	497	4,000	400 00
E. M. Frank, Trustee	292	8,000	800 00
E. M. Frank, Trustee	377	2,000	200 00
G. P. Rixford, Trustee	145	1,000	100 00
G. W. Lace, Trustee	382	317	31 70
Alex. McLaughlin	302	200	20 00
Alex. McLaughlin, Trustee	360	122	12 20
Alex. McLaughlin, Trustee	414	200	20 00
F. J. Sanders	384	98	9 80
F. J. Sanders	385	35	3 50
R. P. Rasmussen	415	100	10 00
R. P. Rasmussen	419	31	3 10
A. F. Thane, Trustee	448	1,073	107 30
A. F. Thane, Trustee	449	922	92 20
Chas. E. Anderson, Trustee	467	654	65 40
Chas. E. Anderson, Trustee	508	600	60 00
W. W. Sargeant, Trustee	460	378	37 80
W. W. Sargeant, Trustee	505	1,000	100 00
W. W. Sargeant, Trustee	518	1,000	100 00
W. W. Sargeant, Trustee	531	131	13 10
J. H. Isham	462	100	10 00
H. H. Noble, Trustee	523	4.000	400 00

And in accordance with law and an order of the Board of Directors made on the 5th day of July, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, Room 12, Rotunda Mills Building, San Francisco, California, on WEDNESDAY, the 4th day of September, 1895, at the hour of one o'clock P. M. of said day, to pay said delinquent assessment thereon, together with cost of advertising and expenses of sale.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on September 4th, 1895, the above sale is postponed to FRIDAY, the 4th day of October, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at the regular monthly meeting held at the office of the company on October 3d, 1895, the above sale is postponed to SATURDAY, the 2d day of November, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on November 2, 1895, the above sale is postponed to MONDAY, the 2d day of December, 1895, at the same place and time of day.

W. W. SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

POSTPONEMENT.

By order of the Board of Directors at a special meeting held at the office of the company on December 2, 1895, the above assessment is postponed to TUESDAY, the 31st day of December, 1895, at the same place and time of day.

W. W SARGEANT, Secretary.

Office, Room 12, Rotunda Mills Building, San Francisco, California.

DELINQUENT SALE NOTICE.

JAMISON MINING COMPANY.—LOCATION OF principal place of business, San Francisco, California. Location of works, on Jamison creek, near Johnsville, Plumas County, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 7) levied on the 9th day of November, 1895, the several amounts set opposite the names of the respective shareholders as follows:

Name.	No. Cert.	No. Shares.	Amt.
George Hackett	195	250	5 00
J. C. Kinckren	147	70	1 40
B A. Knight	142	500	10 00
Edwin O. Knight	144	500	10 00
James Morgan	190	150	3 00
John Sparks	164	1000	20 00
John Sparks	165	1000	20 00
John Sparks	166	2000	40 00
John Sparks	167	1000	20 00
John Sparks	168	1000	20 00
John Sparks	169	500	10 00
John Sparks	216	500	10 00
C. L. Taylor	123	500	10 00
Wm. Trathen	139	500	10 00
Chas. Troon	124	500	10 00

And in accordance with law, and an order from the Board of Directors, made on the 16th day of December, 1895, so many shares of each parcel of such stock as may be necessary will be sold at public auction at the office of the Company, rooms 50 and 54, 120 Sutter St., San Francisco, California, on MONDAY, the 6th day of January, 1896, at the hour of 2 o'clock P. M. of said day, to pay said delinquent assessment thereon, together with coste of advertising and expenses of sale.

SAM. W. CHEYNEY, Secretary.

Office, Rooms 50 and 54, 120 Sutter St., San Francisco, California.

DIVIDEND NOTICE.

The German Savings and Loan Society,

326 California Street.

For the half year ending December 31, 1895, a dividend has been declared at the rate of four and twenty-six hundredths (4 26-100) per cent per annum on Term deposits, and three and fifty-five hundredths (3 55-100) per cent per annum on Ordinary deposits, free of taxes, payable on and after THURSDAY, January 2, 1896.

GEO. TOURNY, Secretary.

DIVIDEND NOTICE.

SAN FRANCISCO SAVINGS UNION.

532 California St,. corner Webb.

For the half year ending with the 31st of December, 1895, a dividend has been declared at the rate per annum of four and thirty-two one-hundredths (4 32-100) per cent on term deposits, and three and six-tenths (3 6-10) per cent on ordinary deposits, free of taxes; payable on and after Thursday, the 2nd day of January, 1896.

LOVELL WHITE, Cashier.

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